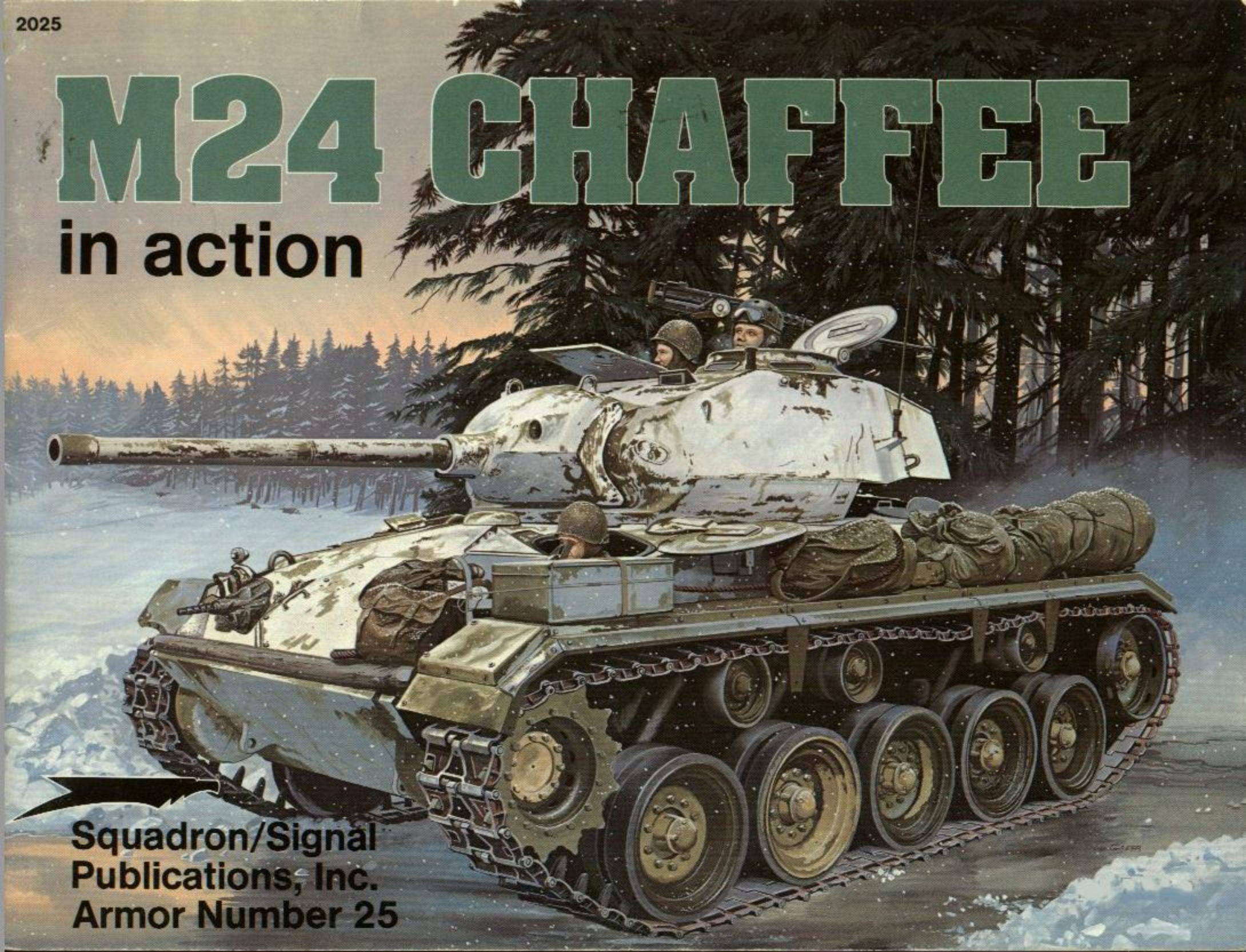
2025

# M24 CHAFFEE

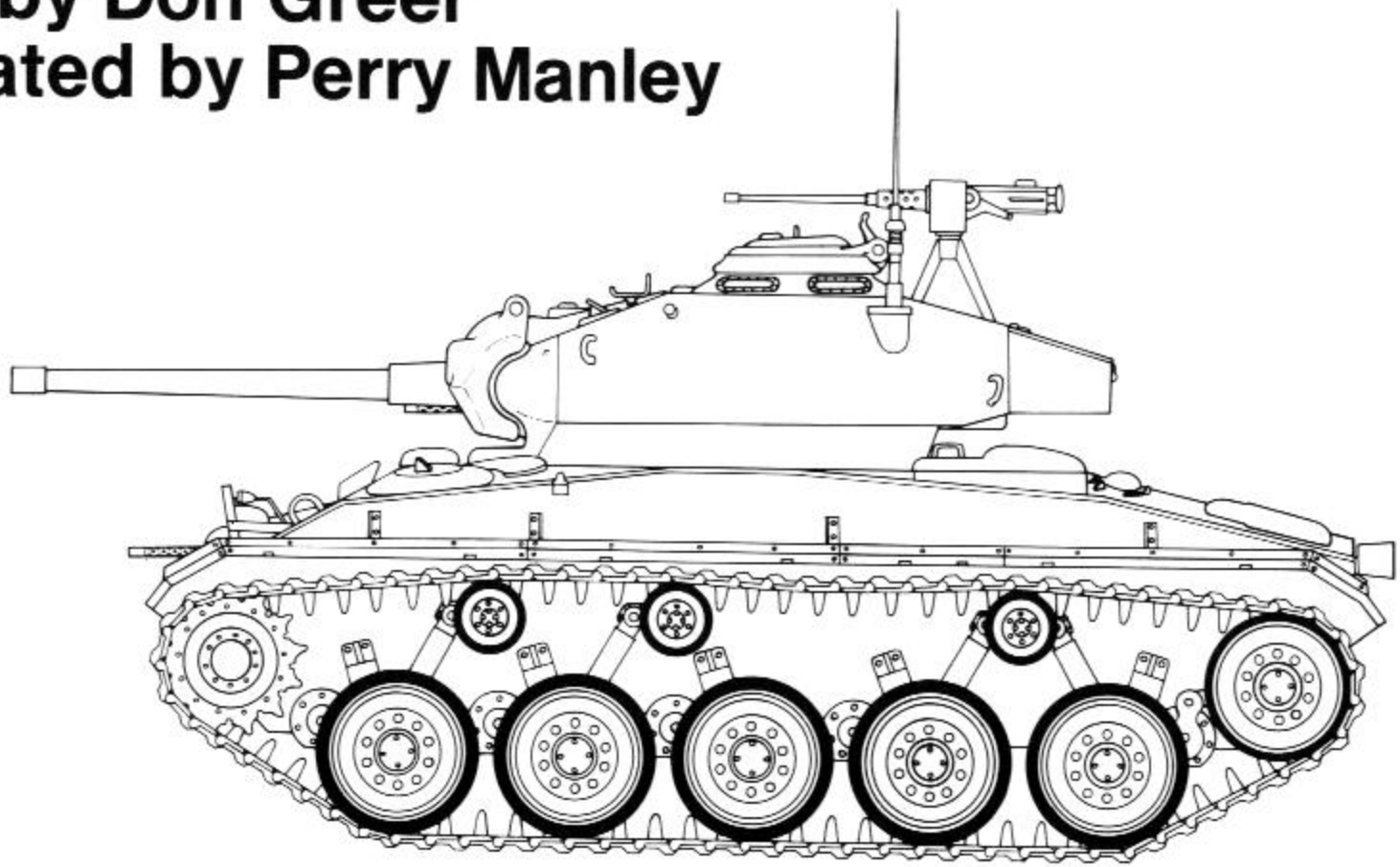
## in action



Squadron/Signal
Publications, Inc.
Armor Number 25

# M24 CHAFFEE in action

By Jim Mesko
Color by Don Greer
Illustrated by Perry Manley



Armor Number 25

Squadron/Signal Publications, Inc.

**An M24 of the 18th Squadron, 14th Cavalry Group patrols the streets of Petit Tiers, Belgium during February of 1945. It was common for M24s in combat to be loaded with the crew's personal gear on the outside of the tank.**



**COPYRIGHT © 1988 SQUADRON/SIGNAL PUBLICATIONS, INC.**
1115 CROWLEY DRIVE CARROLLTON, TEXAS 75011-5010
All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form by any means electrical, mechanical or otherwise, without written permission of the publisher.

**ISBN 0-89747-205-5**

**If you have any photographs of the aircraft, armor, soldiers or ships of any nation, particularly wartime snapshots, why not share them with us and help make Squadron/Signal's books all the more interesting and complete in the future. Any photograph sent to us will be copied and the original returned. The donor will be fully credited for any photos used. Please send them to:**

**Squadron/Signal Publications, Inc.**
**1115 Crowley Drive.**
**Carrollton, TX 75011-5010.**

# Dedication:

To my family, who helped in more ways then they will ever know.

# Acknowledgements

A large number of the photographs used in this book were furnished by the Patton Armor Museum, with a significant number of these originating from the collection of the late Colonel Robert Icks. Photographs not specifically otherwise credited are from these collections. I would like to express my appreciation to the museum staff for all their help in making this project a success. Additionally, the staff of "Armor" magazine provided a great deal of research material. The following people and/or organizations also provided photographic assistance. I hope that no one has been inadvertently forgotten.

US Army
USAF
Pete Harlem
Bob Steinbrunn
ECPA
Dana Bell
George Balin
GIAT
Joe Michaels (JEM Aviation)
David Guthrie
Chriss Foss

A special thanks is due to a number of people who provided other types of support. A former student and wrestler of mine, LT Mark Osterhage, allowed me free use of his car and apartment while doing research at Fort Knox. My mother continues to type my manuscripts, even though she has better things to do with her time. My wife Pat puts up with my foul moods whenever deadlines approach. To all of them, "Thanks a million".

**An M24 Chaffee of A Company, 79th Tank Battalion halts along a railroad embankment during a lull in OPERATION RIPPER conducted in the spring of 1951. The M24s carried large "tiger" faces painted on the front of the turret and hull to frighten superstitious Chinese and North Korean troops. (US Army)**

# INTRODUCTION

During the early 1930s the Army Chief of Staff, GEN Douglas MacArthur, had begun a push to mechanize the Army and felt that the Cavalry should be equipped with tanks. He envisioned an armored Cavalry capable of moving ahead of the infantry to disrupt enemy forces. As a result of his efforts approval was granted to equip the Cavalry with tanks. To circumvent the 1920 Defense Act, which had allocated control of tanks to the Infantry, vehicles were procured for the Cavalry as 'combat cars'. Due to the economic constraints of the Depression, the Army was forced to concentrate funds on a modified version of the infantry tank, instead of a new design.

The late 1930s saw infantry tank units equipped with the M2A2 and M2A3, while Cavalry units used two combat cars, the M1 and M2. The basic difference between these vehicles were the number of turrets carried by each. Infantry tanks had twin side by side turrets while Cavalry models had single turrets.

Events in Europe during 1939 made the Army realize that, although American tanks were mechanically reliable, their armament and armor were obsolete. As a result, the Army began a program to upgrade the infantry tank to bring it in line with European vehicles. It was decided that the new tank would incorporate features of both infantry tanks and combat cars and would be armed with a 37MM gun. This hybrid vehicle was given the designation M2A4 and entered production in late 1939.

The war in Europe gave the Army an opportunity to study modern armor tactics and vehicles. Reports from Europe revealed that the M2A4 was inferior to German armor and needed improvement. In 1940 the Army ordered the armor protection of the M2A4 increased. The existing chassis and suspension could not accommodate the weight of additional armor and had to be totally redesigned. This redesign work gave the Army a new vehicle which was greatly improved over the M2A4. This vehicle entered production in March of 1941 under the designation M3 Stuart.

The M3 Stuart was the first mass produced American tank and a significant number were provided to the British Army under Lend-lease for use in North Africa. British combat reports led to a number of improvements which resulted in the M3A1. Despite these improvements, the Army realized that the M3 had reached its limit and a replacement was needed.

Increased aircraft production had resulted in a shortage of Continental radial engines (which powered the M3) and led the Cadillac Division of General Motors to propose an alternative engine installation. The Cadillac proposal replaced the Continental radial with two automotive engines and an automatic transmission. A prototype vehicle, completed in late 1941, was tested at Aberdeen Proving Grounds where it proved superior to the radial engined M3. It ran quieter, smoother, and had more power. The increase in engine power allowed additional armor to be installed without sacrificing performance and the automatic transmission made driving the vehicle easier. Initial tests were so successful that the Army issued production orders under the designation M4. At this same time, however, an improved Stuart (M3A1E1) was also being considered and to standardize production the two were combined resulting in a new tank with the designation M5 Stuart.

The M5 and M5A1, were far superior to the M3, however, the vehicle still left much to be desired. Armor protection was inadequate and the 37MM cannon was no longer effective against German armor. Although the M5 was mechanically reliable, this was little comfort to American crews facing German tanks such as the Panzer III and IV.

**A Marine Corps M2A4 light tank comes ashore from a landing craft during 1940 or 1941. Events in Europe led the Army to upgrade their armor forces by combining both the infantry tank and combat car, resulting in the M2A4 armed with a 37MM cannon.**

Realizing that the Stuart had reached its limits, the Army began seeking a replacement. In early 1941 a specification was issued for a light tank armed with a 57MM gun. Rock Island Arsenal began work on a prototype under the designation T7 (T for Test). A number of pilot vehicles were built, each featuring different engines and armor, with the T7E2 being selected as the vehicle that offered the most potential. The Army, however, ordered the T7E2 upgunned with a 75MMmm gun, along with increased armor protection.

These new requirements brought the weight of the T7E2 up to the point that the tank now weighed as much as a medium tank. It was then reclassified to a medium tank as a possible replacement for the M4 Sherman. In the event, the T7 proved inferior to the Sherman and development was abandoned in favor of increased M4 production. The T7 project had shown promise, however, changing requirements had compromised the design rendering the vehicle unsuitable as either a light or medium tank. Had the design been adopted earlier, the Army could have had a new light tank in service by early 1943; instead American crews went into combat in an obsolescent vehicle.

**M2A4 was inferior to German, British, and French vehicles then in combat. Using information from European battlefields the Army designed the M3 Stuart which featured a longer chassis, a modified suspension, increased armor protection, and an improved gun mount.**

**An M5A1 Stuart of the 3rd Armored Division leads an M4 Sherman medium tank down a street in Echtz, Germany during 1944. Combat experience with the M3 led to a redesign of the hull, installation of new engines, and an increase in armor protection. The revised Stuart, originally designated the M4, was redesignated the M5 to avoid confusion with the Sherman. (US Army)**

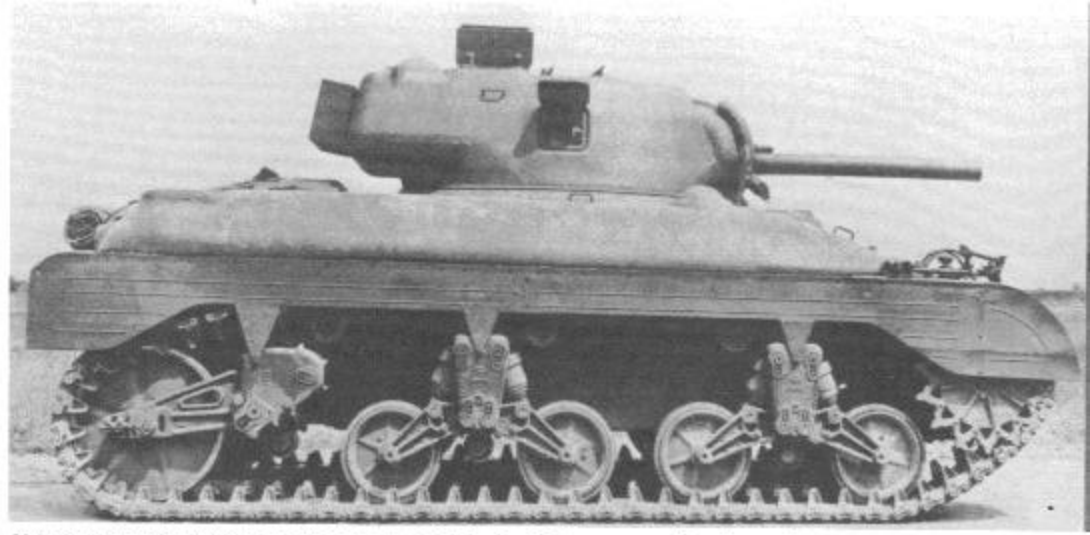
# T24

In November of 1942 American armored units entered combat against German armor in the North African desert. The inherent weaknesses of the M3/M5 series and its 37MM gun quickly became obvious. Various attempts to mount a 75MM gun in the M5A1 met with little success and these projects were abandoned. Faced with these problems, the Army issued a requirement for a new light tank, stating that the new design should utilize the best features of previous vehicles along with the lessons learned from the T7. One of the main problems was the armament of the new tank. The 37MM gun was totally inadequate but the size of the 75MM gun made it impossible to mount in a light tank chassis and remain within weight limits.

The Army Air Force had developed a light weight 75MM gun and concentric recoil system for installation in the B-25 bomber. The M6 gun featured a short barrel and low muzzle velocity, however, these were not considered handicaps since light tanks were not intended for armor vs armor combat which required a high velocity gun. The M6 gun also fired the same ammunition as the M4 Sherman, further increasing its flexibility.

In early 1943 Cadillac GMC began work on a prototype under the designation T24. The proven rear mounted liquid cooled Cadillac engines and hydraulic transmission were retained along with a number of features from the earlier T7. To improve cross country mobility, the suspension was changed from the vertical volute type to a torsion bar suspension based on the M18 Hellcat GMC. Armor protection was to be 25MM throughout with the armor angled for maximum deflection on all hull and turret faces.

The internal layout of the T24 was similar to other US tanks with the driving compartment in the front, fighting compartment in the center, and engine compartment in the rear. The two 110 hp eight cylinder V8 engines and a Cadillac hydraulic transmission with two forward and one reverse gear powered the prototype. Although many thought the torsion bar suspension used on the M24 was copied from German designs, the design was American with the designer holding patents on the suspension that dated back to the early 1930s. The running gear consisted of five sets of paired road wheels, three return rollers, a front mounted drive sprocket, and a rear mounted idler wheel which kept tension on the 16 inch steel block track constant regardless of the terrain.



**Although the Stuart was mechanically reliable, the 37MM gun and inadequate armor protection left much to be desired. During 1941 the Army began testing a prototype light tank armed with a 57MM under the designation T7E2.**

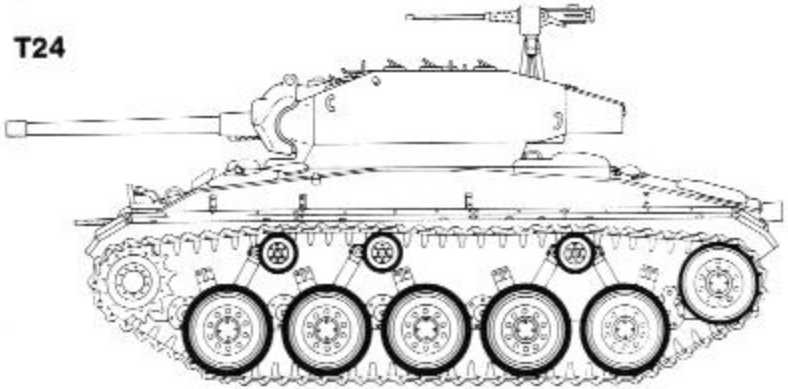
The turret mounted the M6 75MM gun along with a coaxial .30 caliber machine gun. A second .30 caliber gun was mounted in the right side of the glacis plate and was fired by the assistant driver. For anti-aircraft defense a .50 caliber machine gun was mounted on the turret roof on a light weight tripod pintle behind and to the right of the commander's hatch. Two direct vision periscopes were mounted on the turret roof for the commander and gunner. The T24 carried forty-eight rounds of 75MM ammunition in water filled ammunition containers, 440 rounds of .50 caliber ammunition, and 3,750 .30 caliber rounds. Fuel capacity was 110 gallons, giving the T24 a range of 100 miles at 34 mph.

The pilot model was completed in October of 1943 and immediately began testing. These tests were successful and the Army issued a production contract for 1,000 tanks under the designation M24. Later the contract was raised to 5,000 vehicles with production being split between Cadillac and the Massey-Harris company. In keeping with the Army practice of naming tanks after American generals, the M24 was named Chaffee, after the founder of the Armor Corp, GEN Adna Chaffee. Deliveries began in April of 1944 and M24s were quickly issued to armored units in training for deployment to Europe.

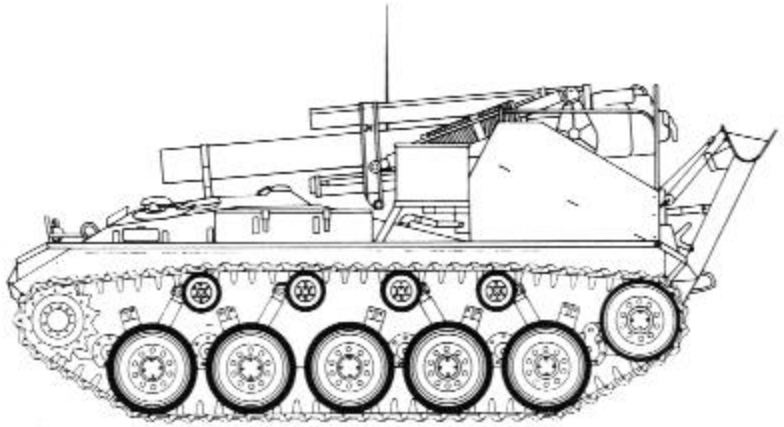
**The prototype T24 during field tests at the Aberdeen Proving Grounds in Maryland. The T24 prototype featured side skirts, angled armor plate, a rear turret storage bin, and lacked a cupola for the commander.**

# DEVELOPMENT

**T24**

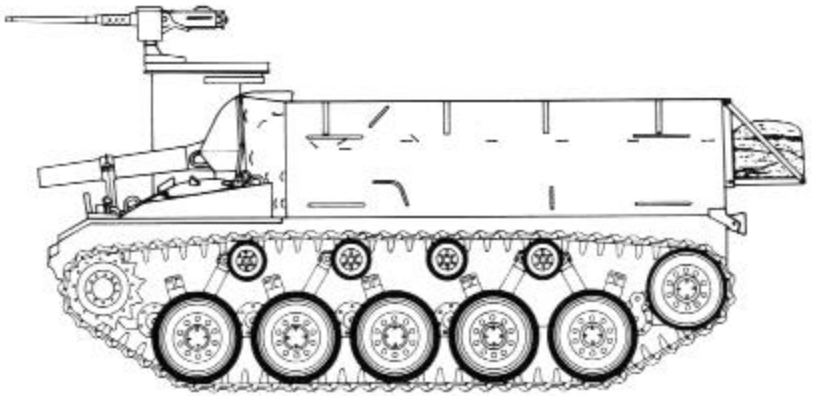


**M41**

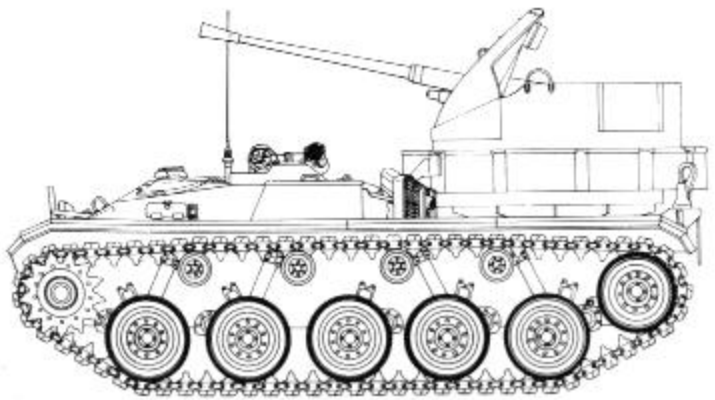


**M24**

**M37**



**M19**



**NM116**

# M24 Chaffee

The production M24 differed little from the T24 prototype. The turret was modified to incorporate a cupola for the commander. With the addition of the cupola, one of the turret roof mounted periscopes was deleted and the turret ventilator was repositioned in front of the loader's hatch. The light tripod anti-aircraft machine gun mounting was replaced by a similar mount with heavier legs to better absorb the recoil of the heavy .50 caliber machine gun. To improve gun laying and aiming, a gyro-stabilizer was installed for the main gun.

By the summer of 1944, production M24s were being delivered to light tank units in Europe to replace the M5s and M5A1s. To familiarize American units with the M24, a number of Chaffees were used to tour American bases, where instruction on the recognition features of the M24 were stressed. Since the M24 was the first American tank to have a torsion bar suspension, which was a recognition feature normally associated with German tanks, there was concern that the M24 might be mistaken for an enemy vehicle. The familiarization program was aimed at preventing such cases of mistaken identity.

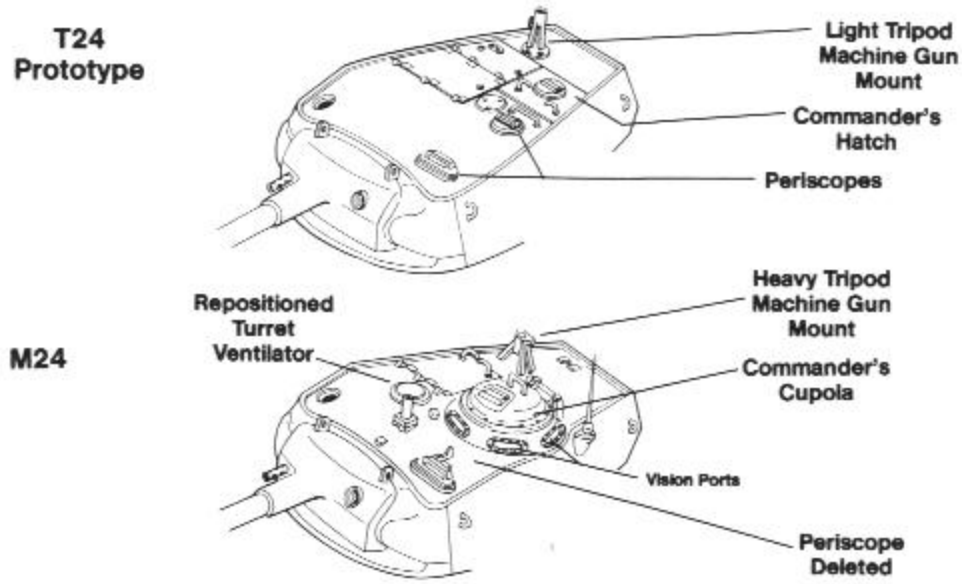
Light tank units fortunate enough to re-equip with the M24 quickly found that they now had a vehicle superior in all respects to the earlier M5 series. The combat debut for the M24s was the Battle of the Bulge during December of 1944. Although still too thinly armored to stand up to heavier German tanks in a tank vs tank engagement, the improved firepower of the 75MM cannon at least gave the crews a chance to fight their way out of trouble. Survivability was further enhanced by the high speed and mechanical reliability of the M24. By this time in the war, however, the majority of German armor had been either destroyed or incapacitated by lack of fuel and there were relatively few engagements between M24s and German tanks. On several occasions, however, engagements did take place and M24s were able to knock out a number of Panther and Tiger tanks with a combination of surprise, position and luck. These engagements were, for the most part, flukes and Chaffee crews did not deliberately seek out German armor.

The primary role of the M24 was scouting and mechanized infantry support. M24s were found to be ideally suited to the mechanized infantry support role, escorting and providing fire support for halftrack mounted infantry. The 75MM main armament of the M24 could fire high explosive rounds which proved extremely effective against soft skin vehicles, troops, buildings, and bunkers. Using tactics developed earlier around the strong points of the M5 series, M24 crews were able to effectively utilize the more potent Chaffee with devastating effect. M24s saw considerable action in the closing months of the war, taking part in the crossing of the Rhine and the final push into Germany.

During the latter part of the war some 300 M24 were supplied to Great Britain to re-equip selected light tank units. These units, however, saw little if any action before the end of hostilities. A limited number of M24s were also supplied to the Soviet Union for evaluation purposes, however, the war ended before planned Lend-lease shipments of M24s to Russia were begun.

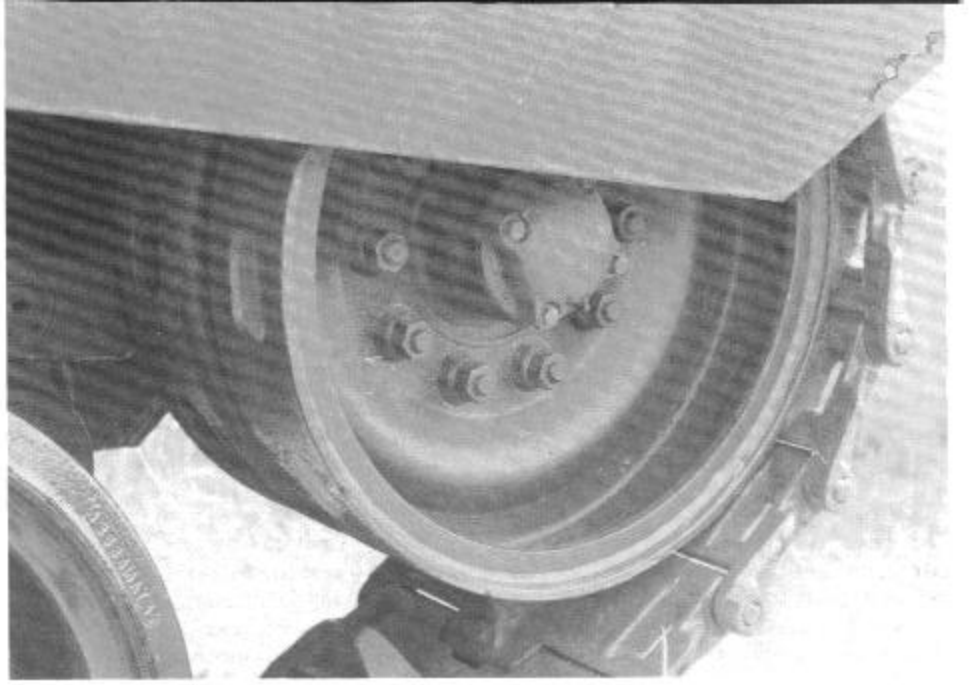
**During December of 1944 American armored troops in Europe began converting from the M5 Stuart to the M24. The M24s were first committed to combat during the German offensive in the Ardennes Forrest, known as the Battle of the Bulge. (US Army)**

## Turret Modifications



This officer is instructing men of the 39th Infantry Regiment, 9th Infantry Division on the recognition points of the M24. The torsion bar suspension of the M24 gave it a 'German' look and to avoid cases of mistaken identity M24s toured various units to familiarize troops with the Chaffee. (US Army)

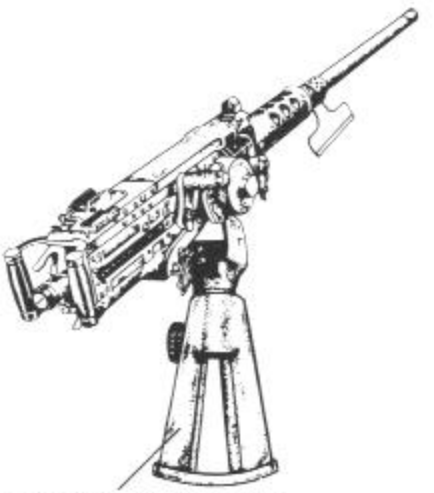
The crew of an M24 of the 743rd tank Battalion, 30th Infantry Division conduct firing practice with the 75MM main gun. Although not as powerful as the cannon carried by the M4 Sherman, the Chaffee could fire high explosive rounds which were devastating against troops, softskin vehicles, and buildings. (US Army)



The idler wheels of the T24 had a series of ten oblong shaped lightening holes cut into the rims to reduce the weight of the idler assembly. Weight saving features were employed throughout the T24 design. (Mesko)

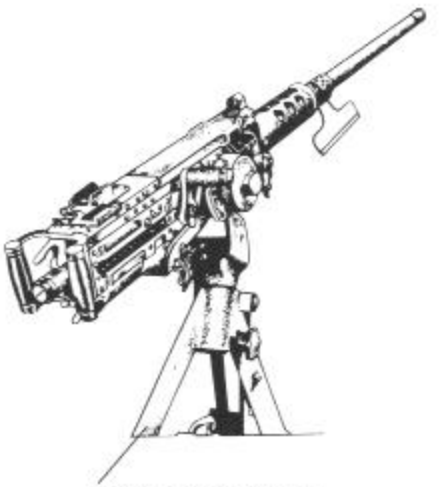
## Anti-Aircraft Machine Gun Mount

T24 Prototype

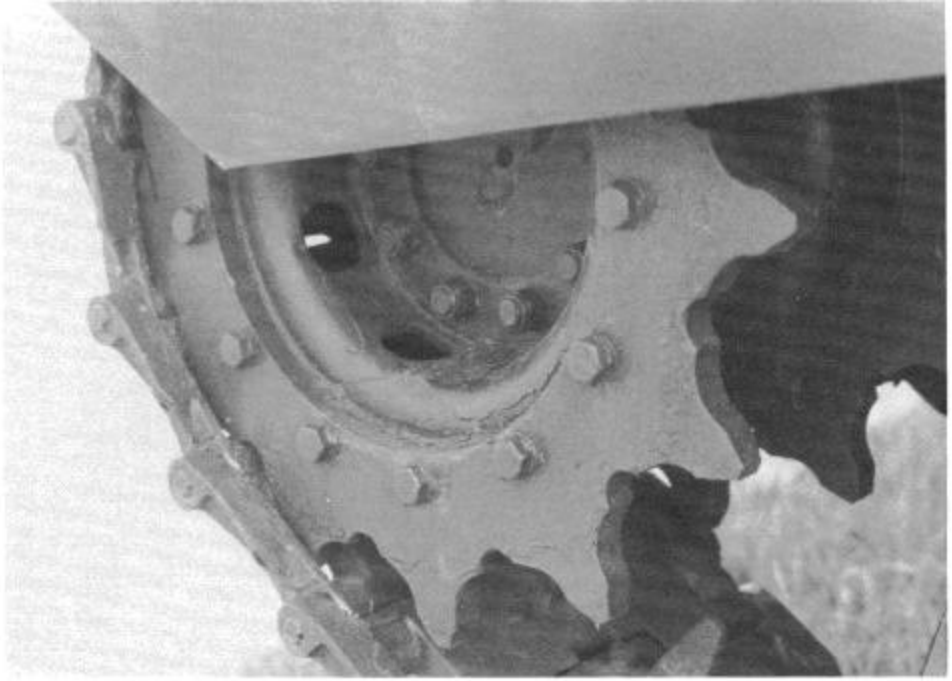


Taller Light Weight Mount

M24



Shorter Heavy Mount

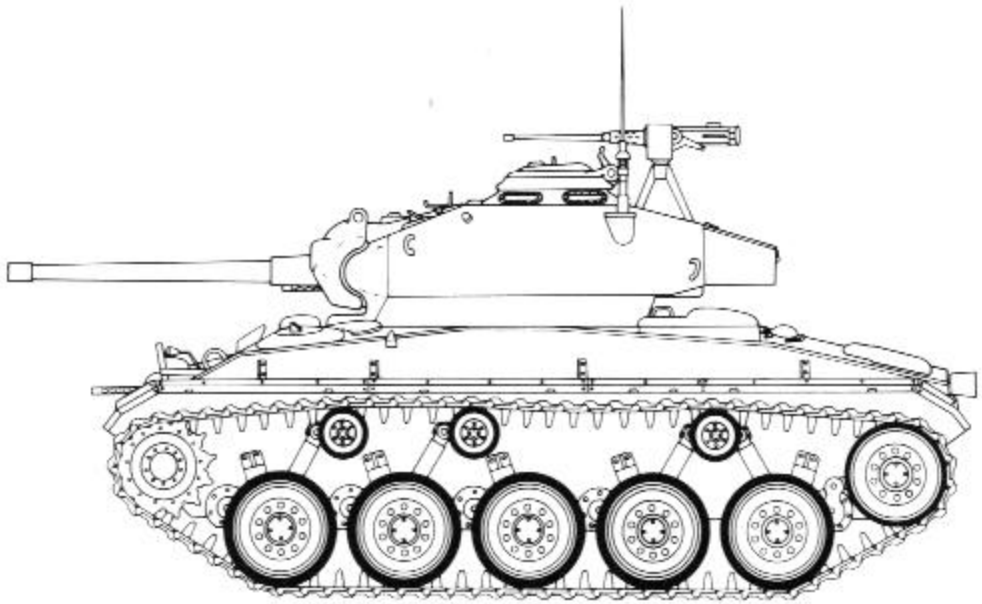


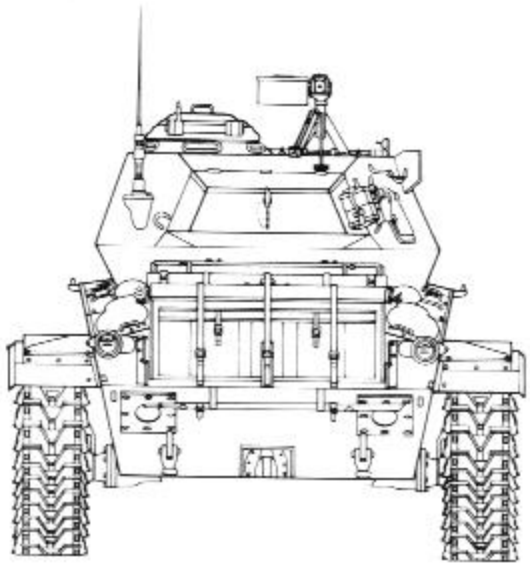
The drive sprocket also has a series of eight lightening holes cut into the rims. The outer rims had nearly circular shaped holes while the inner rims had oblong holes similar in shape to the rear idler wheel, however, the drive sprocket holes ran transversely. (Mesko)

The crew of *Ally Oop III* pause during the advance into Germany in January of 1945 and scan the horizon for signs of enemy activity. The dark Olive Drab camouflage makes the M24 highly visible against the snow covered fields. (US Army)

A pair of M24s support infantrymen advancing across open ground outside Rhineburg, Germany during the Spring of 1945. The M24 on the left has been hit and the stored gear on the engine decking has been set afire.

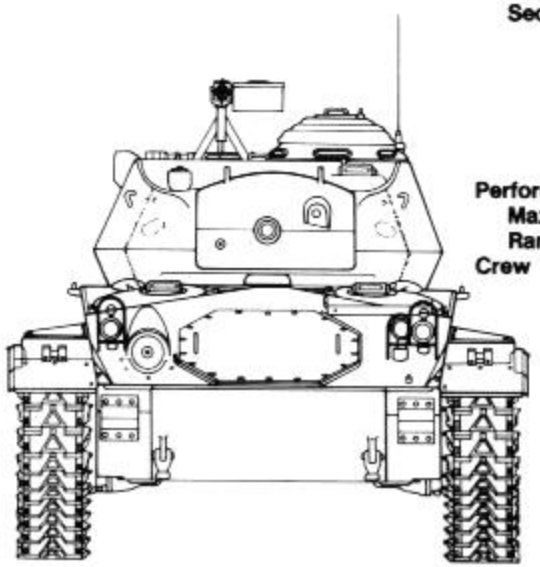
This M24 of the 704th Tank Battalion, 82nd Airborne Division was crudely painted in the field with a coat of Whitewash for winter camouflage. The raised clear panel in front of the driver's compartment is a folding windshield which helped keep dirt, road spray, and rocks from hitting the driver. (US Army)

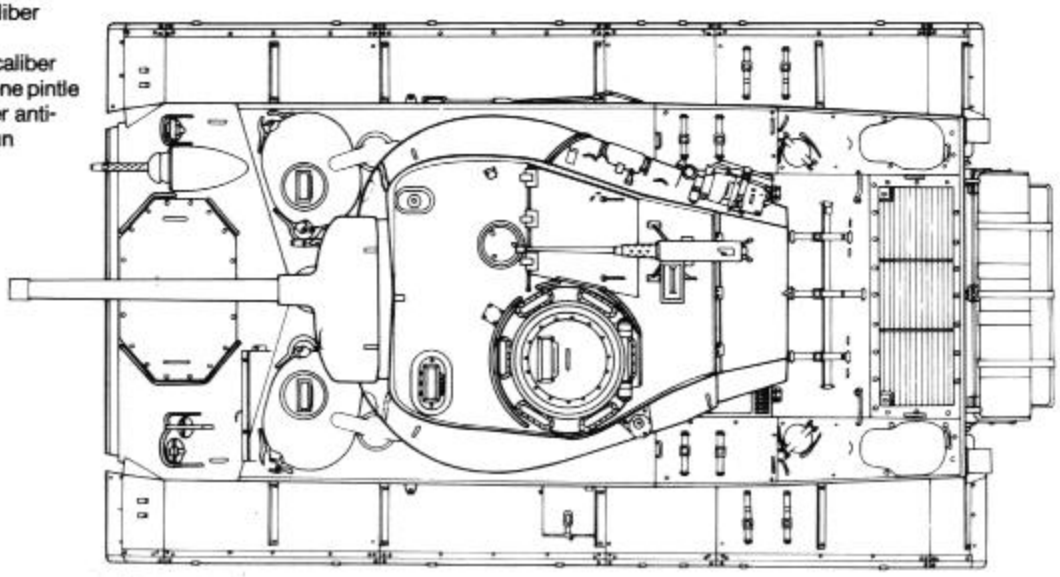




# SPECIFICATIONS
## M24 Chaffee

| | |
|---|---|
| **Length** | 18 feet |
| **Height** | 8 feet 4 inches |
| **Width** | 9 feet 4 inches |
| **Ground Clearance** | 17 inches |
| **Maximum Weight** | 38,750 pounds |
| **Powerplants** | Two Cadillac V-8 gasoline engines |
| **Armament** | |
| **Main:** | One 75MM cannon |
| **Secondary:** | One coaxial .30 caliber machine gun, one bow mounted .30 caliber machine gun, and one pintle mounted .50 caliber anti-aircraft machine gun |
| **Performance** | |
| **Maximum Speed** | 35 mph |
| **Range** | 175 miles |
| **Crew** | Four |





A column of 30th Infantry Division, 9th Army M24s move past the wreckage of a German Pak 75 anti-tank gun on a fog shrouded road near Haulthausen, Germany in March of 1945. The lead tank carries extra jerry cans, helmets, and other personal gear in a field installed rack on the glacis plate. (US Army)

An M24 crosses an engineer's bridge over the Po River in Italy during April of 1945. The M24 is loaded down with external stowage including a case of 'C' rations on the turret roof. (US Army)

An M24 fires a smoke round from the smoke mortar mounted in the turret roof outside Kornelimunster Germany during December of 1944. The smoke mortar was later deleted with the opening covered. Typical of most M24s in the field, this vehicle is missing the side skirts. (US Army)

The crew of a Chaffee of the 117th Cavalry Reconnaissance Squadron, VI Corps conducts firing practice prior to deployment into Germany in March of 1945. The segmented White circle around the turret star is unusual for an M24 in the European Theater of Operations (ETO). (US Army)

An M24 Chaffee covered with infantrymen moves past the burning hulks of two German recovery vehicles on the outskirts of Salzburg, Austria in May of 1945. The extra gear piled on the rear of the tank is common because the M24 lacked internal storage. (US Army)

A British M24 undergoes trials at Bovington, England to gauge its performance in comparison to British vehicles. The British received a number of M24s in the closing months of the war, however, it appears that none of these saw combat. (Foss)

# Modifications and Special Vehicles

## T24 E1

One early T24 hull was modified with an alternative engine under the designation T24 E1 as a possible back up in the event of shortages of Cadillac engines and to determine if the alternative offered any increase in performance. This hull was fitted with the R975 C-4 engine used on the M18 Hellcat in place of the Cadillac engines. The R975 C-4 used a stepless torque converter instead of the hydromatic transmission. To accommodate this engine the rear decking was raised and the engine louvers changed. Aside from the engine louvers the only other external change was the addition of a longer gun barrel fitted with a muzzle brake. By the time work on the T24 E1 was completed the war was nearly over and, since it offered no significant increase in performance, the project was terminated.

As with most new vehicles the M24 was used as a test bed for a variety of new ideas or modified to study various equipment installations aimed at improving the basic vehicle.

**Floatation Devices:**

During 1944 the Army experimented with a flotation device which would allow the M24 to come ashore from landing craft that could not be brought into the beach. Pontoons were fitted both on the front and rear of the vehicle and grousers were added to the tracks to propel the tank in the water. The pontoons were designed to be jettisoned once the vehicle was ashore, however, they proved to be extremely unwieldy in the water. In the event, the device, designated the M20, never progressed beyond the test stage.

**Recovery Vehicles:**

During 1943 a prototype recovery vehicle based on the M24 chassis, designated the T6E1, was completed and began testing. This project, however, was cancelled when the war ended. Following the war two similar vehicles, based on M24 components, were designed as cargo/repair/recovery vehicles. Designated the T5E1 and T43E1, these vehicles had large cranes mounted on a flat rear deck while the crew rode in a truck like cab mounted on the front of the vehicle. The limited lifting capacity of the cranes, coupled with the introduction of newer, more powerful recovery vehicles, led to the cancellation of this project while still in testing.

**Armament experiments:**

One of the more unusual experiments carried out with the M24 involved the use of M24 turrets on other vehicles. During 1945, in an attempt to upgrade the firepower of the Landing Vehicle Tracked (LVT) 4A, the turret of an M24 was installed in place of the standard howitzer armed turret. Although tests were successful, the war ended and the project was abandoned.

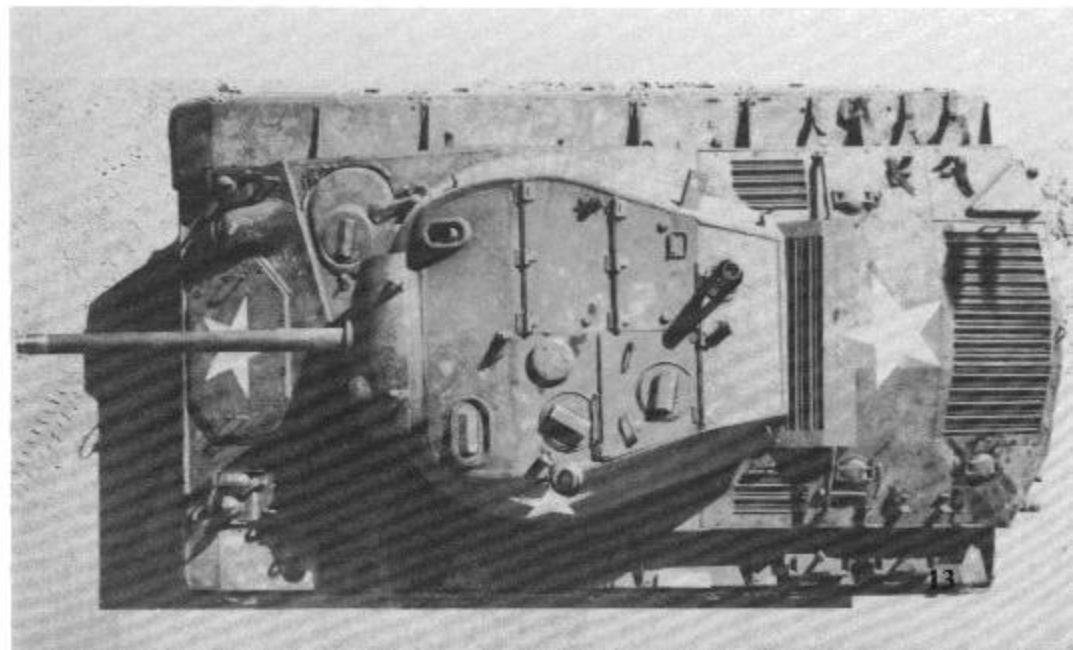
The French experimented with upgunning the M24. One project involved installing the turret of the newly developed French AMX 13 light tank on the chassis of an M24. The AMX 13 turret mounted a high velocity 75MM gun which would have provided the M24 an improved anti-tank capability, however, the French lost interest in the project and no further effort was made at rearming the M24 with the AMX 13 turret.

The French also experimented with using the M24 turret on the AMX 13 hull and at least one vehicle was so modified.

A third project involved installation of an 80MM cannon in the M24 turret. At least one example was modified as a possible method to inexpensively upgrade the firepower of the Chaffee for foreign users. This project ended when no orders for the modified Chaffee were forthcoming.

**A T24 trials vehicle was modified to accommodate a stepless torque converter in place of the standard transmission under the designation T24 E1. The rear deck was raised, additional venting installed, and the rear hull plate was reconfigured.**

**The rear deck of the T24 E1 featured a completely revised engine louver arrangement with three sets of louvers being added immediately behind the turret and additional louvers being installed on the engine rear decking.**



**Anti-Aircraft Armament:**

A series of tests aimed at improving the anti-aircraft defense of the M24 were carried out after the war. One test involved the installation of a T122 twin .50 caliber remote controlled machine gun mount in place of the commander's cupola. The advantage of the T122 mount was that it could be fired from inside the tank, while the crew remained under cover. Tests showed that the system was not effective, especially against high speed jet aircraft, and the project was abandoned.

**Suspension Experiments:**

German success with overlapping bogey wheel suspensions, which were fitted to both halftracks and prime movers, led the US Army to investigate this type of suspension. One M24 was fitted with the suspension system from a German twelve ton prime mover in a test to determine if this type of suspension would result in any performance improvement over the standard M24 suspension. After a series of tests, Army officials concluded that there was no significant increase in performance and further work on the project was cancelled.

**Bulldozer Adaptation:**

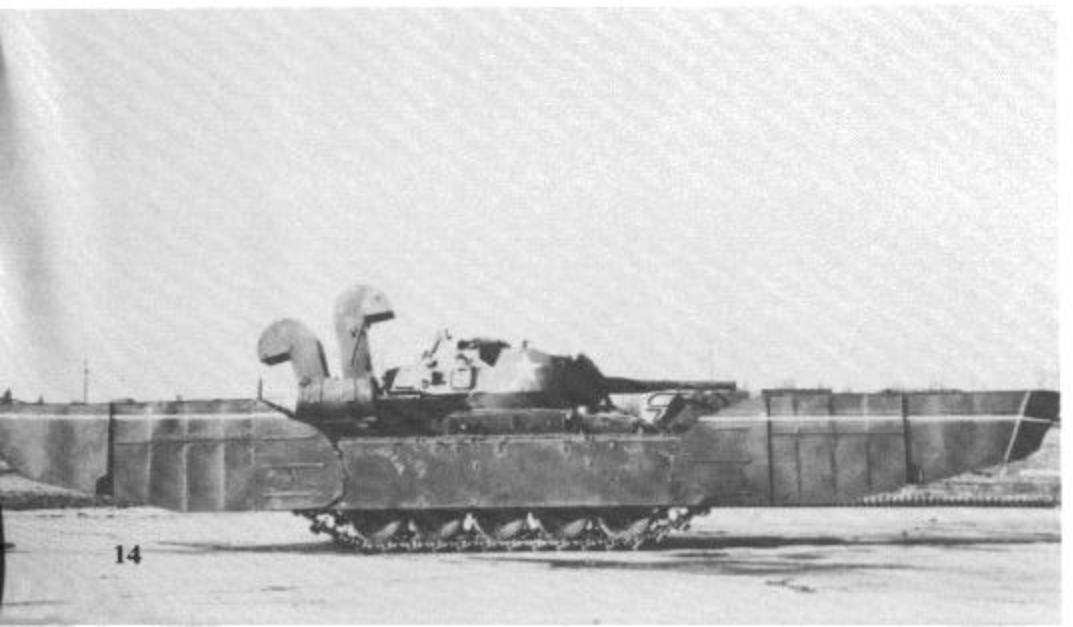
Following the war a number of different bulldozer mounts were tested on the Chaffee. From all available evidence it appears that most if not all postwar M24s were modified with mounting brackets on the front hull for the installation of a bulldozer blade, although there is little information on the actual use of this device by M24 units. It is believed that although the M24 had the capability to mount a bulldozer blade, however, there was little operational use of this equipment.

**Deep Wading Gear:**

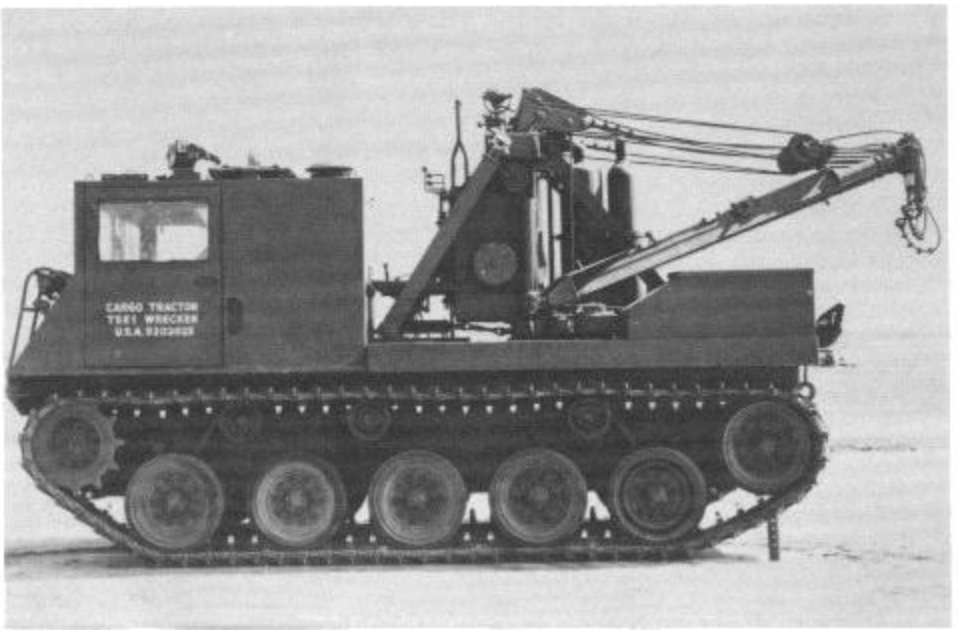
A number of tests were conducted aimed at improving the ability of the M24 to ford deep streams by waterproofing the hull and adding air trunks for the engine. The practicality of this system had been proven in the war and adapting it to the M24 created no major obstacles. There is, however, little evidence that this feature was used to any extent, either in training or actual operations.

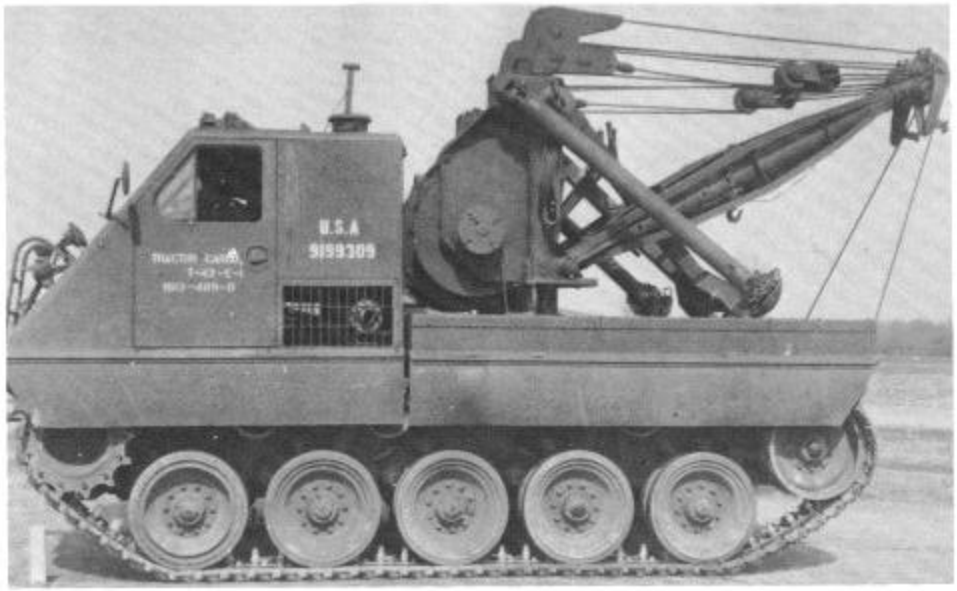
**The T6E1 was a trials vehicle designed to give the Light Combat Team a compatible armored recovery vehicle. Based on the M24 chassis, the T6E1 was tested toward the latter part of the war, however, when the war ended the project was cancelled.**

**The boat like M20 Flotation Device fitted to this M24 at Aberdeen Proving Grounds gave the Chaffee the ability to swim, however, it proved very unwieldy in the water and was never approved for operational use.**



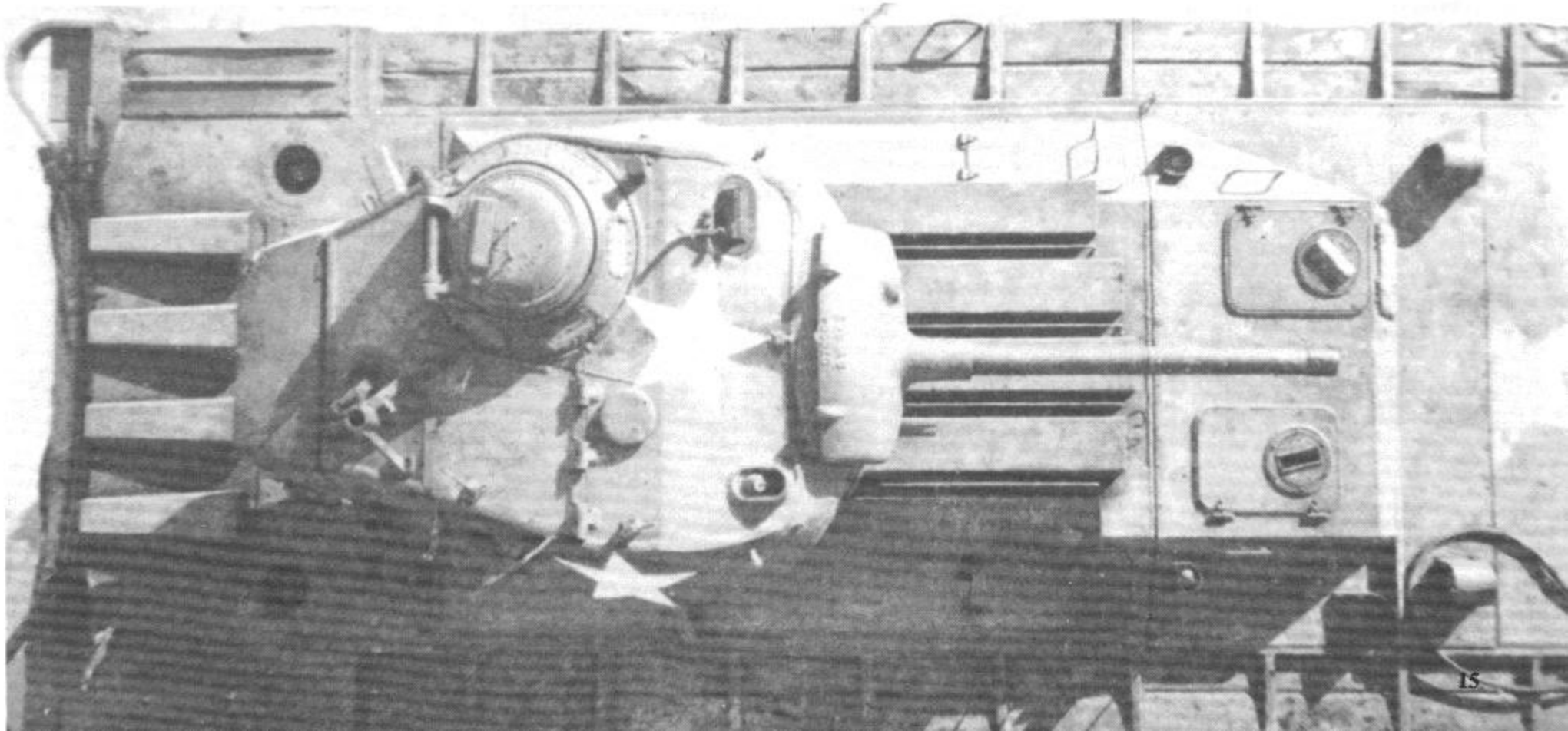
**The T5E1 was a softskinned utility vehicle based on the M24 chassis tested after the war. The T5E1 was intended to be a combination cargo tractor and wrecker, however, the project never progressed beyond the prototype stage.**






(Above) The T43E1 prototype softskinned utility vehicle was also based on the proven M24 chassis and intended primarily for use in handling large bulky cargos such as engines.

(Below) During 1945 an LVT 4(A) armored amphibious tracked vehicle was outfitted with an M24 turret in an attempt to upgrade the firepower of the LVT. As with so many other projects, the end of the war resulted in the project being cancelled.



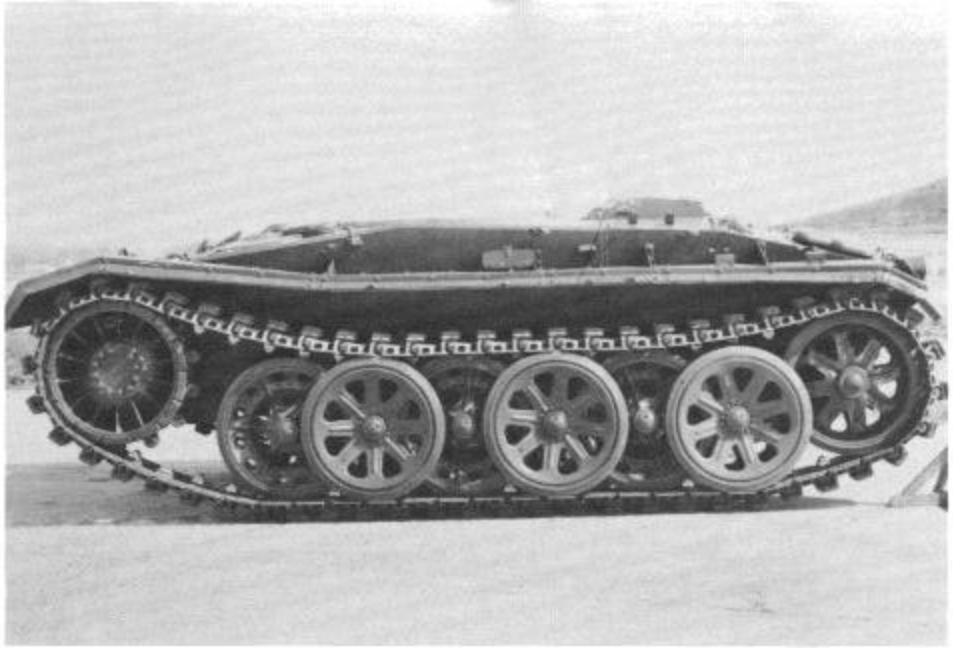
**M24/AMX13 Turret**

At least one M24 Chaffee turret was fitted to an AMX 13 chassis and subjected to a series of field trials. It is believed that the French never intended to actually develop such a hybrid version of the M24 for service use. (ECPA via Foss)

(Above) The French developed a light weight 80MM gun and tested it in an M24 turret with the aim of developing a relatively inexpensive upgunned M24 version for sale to smaller nations. (GIAT via Foss)

(Left) The French experimented with mounting the turret of an AMX 13 light tank on the chassis of an M24. Although the tests were successful it appears that the project was meant as an experiment rather than a prototype for an upgrade of the M24 fleet. (Foss)

(Below) A twin .50 caliber remote controlled cupola was developed for use on the M24. The mount proved to be impractical for service use, although it influenced the development of machine gun armed cupolas used on later vehicles.



(Above) One M24 hull and chassis was fitted with a German overlapping bogey wheel suspension from an 18 ton tractor. The suspension system was thoroughly tested but since it offered no significant improvement in performance the project was cancelled.

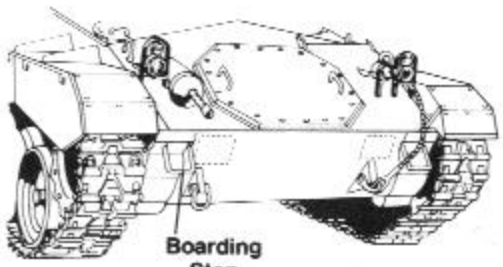
(Above) The M3 Bulldozer mount proved to be more practical, however, there appears to have been little service use of the Bulldozer kit by operational M24 units.

(Right) A number of different Bulldozer modifications were tried on the M24. This M24 has a modified M1 Bulldozer which proved to be unsuccessful because of the need to attach the mount to the M24s suspension system.

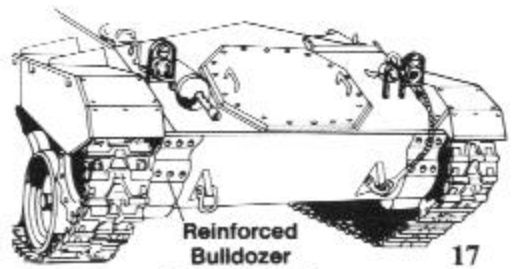
(Below) The M24 could be fitted for deep wading and amphibious operations by waterproofing the hull and attaching breathing trunks to the rear engine deck. This modification was successfully tested but little if any operational use was ever made of this system.

## Bulldozer Pads

M24 (Early)




M24 (Late)



# Post War Service

Following the end of the Second World War, the United States began a demobilization of the Army and with it the armored force. The M24 was selected to be the standard post-war light tank replacing all earlier light tanks. M24s were also selected to be the light tank assigned to the ten constabulary regiments stationed in Germany to police the American sectors. The liberated European nations began rebuilding their armed forces with the M24 becoming the most common armored vehicle provided under the Military Assistance Program. The mechanical reliability, good performance, and maintainability of the M24 proved especially welcome to these nations as they rebuilt their respective armored formations.

During the immediate post-war period American armored divisions began a slow reorganization. Light tank companies, which had previously been attached to tank battalions, were detached and combined to form a reconnaissance battalion within the armor division. The reorganization was completed during the mid-1950s. A number of Army Reserve and National Guard armored units were re-equipped with M24s as the Army cut back on front line units and reassigned their missions to the 'citizen' soldiers.

During the early 1950s the M24 track was changed from the T72E1 steel track to the T851 rubber chevron track. Rubber chevron tracks were fitted because they caused less damage to roads, bridges, and highways than the conventional steel tracks. During this same time, track grousers were also tested and although they did improve the M24's ground pressure ratio, they never became a standard issue item.

## Korea

On 25 June 1950 the North Korean Army, spear headed by formations of Soviet built T-34/85 tanks, launched an all-out invasion of the Republic of South Korea. The only available American armor which could be immediately committed to Korea were the M24s attached to the U.S. Occupation Forces in Japan. On paper these forces should have been of battalion strength and equipped with M4 Sherman tanks. Budgetary considerations and the weight restrictions imposed by Japanese roads, however, had resulted in each battalion being equipped with one company of M24s. These understrength units were all that were available for rapid deployment to Korea.

Within a few days of the North Korean invasion these units were rushed to Korea, seeing their first action against North Korean T-34s on 10 July. The M24 was totally outgunned by the T-34/85. The M24s main armament could not penetrate the armor of the T34/85 and in their first engagement, the Chaffees lost two of their number but were able to knock out one T-34. The shortcomings of the M24 in tank vs tank combat were obvious and during the remainder of the summer, engagements with T-34s took place only when there was no alternative. The arrival of Army and Marine Corps M4 Shermans and M26 Pershings in August of 1950 finally redressed the armor balance in favor of American and South Korean forces. From this point on the M24s were assigned duties more in line with their capabilities, serving out the remainder of the war in the infantry support and reconnaissance roles. A number of M24s were turned over to the fledgling South Korean Armored Corps and saw limited duty toward the end of the war*.

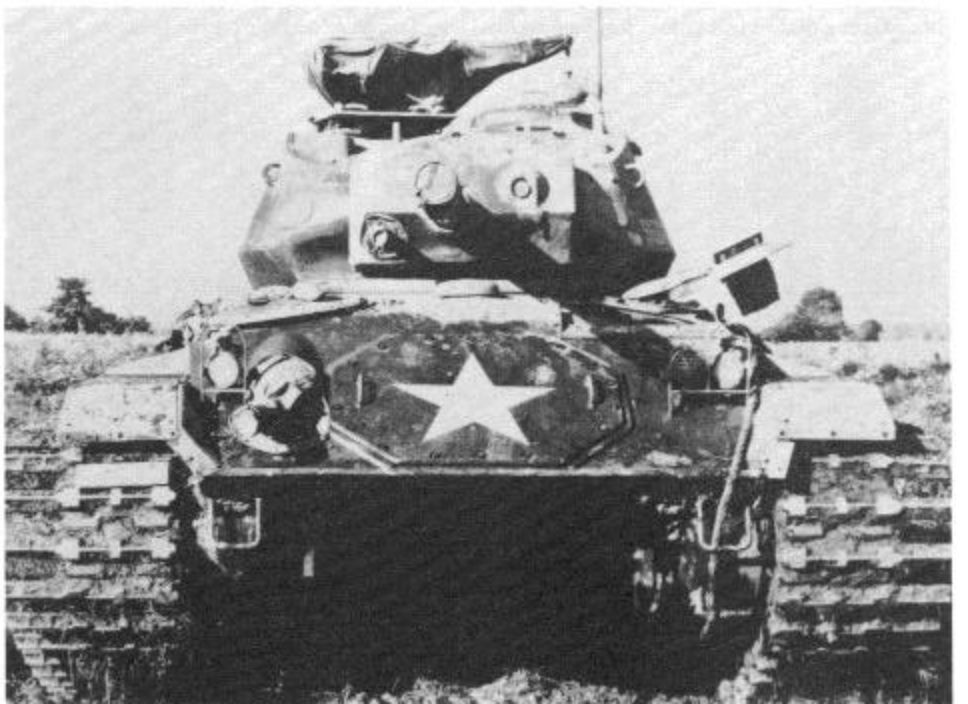
## Indochina

The largest user of the Chaffee outside the United States was France, with the French receiving over 1,200 M24s for service in Indochina and Metropolitan France. Initial deliveries of M24s to French units in Indochina began in late 1950. Prior to that time the United States had viewed the French occupation of Indochina as a colonial power attempting to regain control over its former territory against the will of the native people.

**A more detailed account of the M24 in Korea can be found in the author's "Armor in Korea" from Squadron/Signal Publications.*

**Early production M24 Chaffees were equipped with a 16 inch rubber-bushed, center guided track with a total of seventy-five links. Originally designated the T72, the track was later improved under the designation T72E1.**

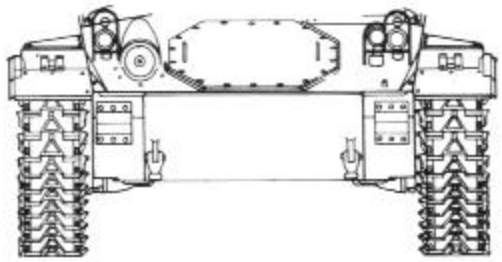
**The M24 had a good ground pressure ratio, however, the army felt that track grousers could improve it further. Although there was a noticeable improvement with the grousers fitted, they never became standard issue because of the time needed to install them and their thin, easily damaged construction.**

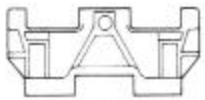


**An M24 of the 6th Cavalry patrols along a country road near the Czechoslovakian border during 1952. The Chaffee would have been in the forefront of action if the Cold War had turned hot in Europe during the early 1950s. (Guthrie via Harlem)**

## M24 Tracks

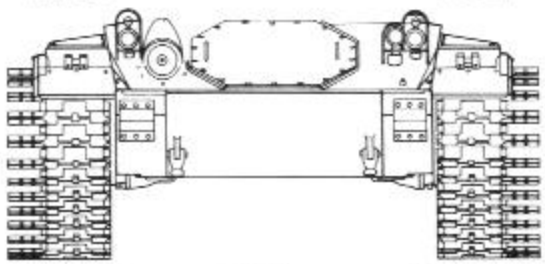
**M24 (Early) T72E1 Steel Track**



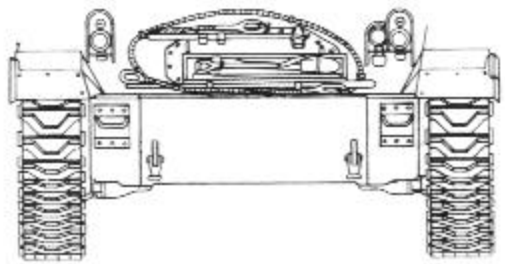


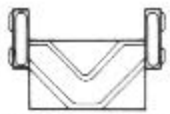
**T72E1 Pattern**

**M24 T72E1 Track with Grousers**



**M24 (Late) T85E1 Rubber Track**





**T85E1 Pattern**

With the communist invasion of South Korea, however, American attitudes quickly changed to one much more favorable to the French position. The fighting in Indochina was now viewed as another struggle against communism and massive military aid for the French was authorized.

As they were delivered, the M24s were used to re-equip units which were still using old M5A1 Stuarts left over from World War II. Although larger then the Stuart, the M24 was far superior in overall performance and the more powerful 75MM cannon fired a greater range of ammunition. In particular the low ground pressure of the M24 was greatly appreciated by the French since it allowed the Chaffee to traverse marshes, swamps, and rice paddies which had been inaccessible to the Stuart. The M24s were assigned to either the newly organized *Groupment Blinders* (GB - infantry support groups), or *Groupes d'Escadron de Reconnaissance* (GER -reconnaissance groups). GERs had been formed during 1951 in an effort to more effectively utilize armored assets within Indochina.

From its introduction into combat during 1950 until the final French withdrawal M24s were in constant use for convoy security, infantry support, static defense, patrolling, and in offensive armor/infantry sweeps against the Viet Minh. The jungle terrain in Indochina made it relatively easy for the Viet Minh to ambush French units and the firepower of the Chaffee was a welcome counter to this enemy tactic. When units were escorted by M24s, losses were relatively light compared to what they might have been without the presence of the Chaffee. The most famous action of the Indochina War was the siege of Dien Bien Phu and the M24 played a major role in French plans for the coming battle.

Ten M24s were disassembled in Hanoi and airlifted into the valley fortress where, after reassembly, they were used to provide fire support for the garrison and its outlying strong points. The M24s served as mobile artillery and to break up Viet Minh attacks, shifting locations frequently as the situation demanded. Despite outstanding service throughout the siege by the M24 crews, the French were eventually overcome by the superior firepower marshalled by the Viet Minh in the hills overlooking the French strong point. When the battle ended in May of 1954, six M24s were still serviceable, along with two damaged vehicles which were being used as pillboxes. When the French surrendered, all six were rendered unserviceable by their crews, however, the Viet Minh were later able to repair one. This vehicle, along with a second M24 which was towed behind it, was later used by the Viet Minh to make a propaganda movie. The hulks of several M24s still rest in the valley at Dien Bien Phu as silent monuments to the fighting that took place there.

**M24s were the primary equipment of post-war armored reconnaissance battalions. This M24 of the 4th Reconnaissance Battalion tries to extract itself from the mud during Exercise 'Rebound' held in Austria during the Spring of 1951. The engine cover has been raised to allow more air into the engine compartment and prevent overheating. (US Army)**

# Vietnam

Following the withdrawal of French forces from Indochina during 1955 as part of the Geneva Accord, a number of M24s were given to the newly formed Army of the Republic of Vietnam (ARVN). Supplemented by additional deliveries of Chaffees from the United States, these M24s were used to equip four cavalry squadrons assigned to ARVN cavalry regiments. Additionally, a small contingent of M24s were assigned to the ARVN armor school for training armor officers.

When hostilities between the American backed regime of Ngo Dinh Diem and the communist Viet Cong (VC) broke out in the late 1950s, ARVN forces initially made little use of the M24 against the elusive guerrillas. The Chaffees were normally used in static defense, an occasional fire support mission, or in propaganda parades. By the early 1960s opposition to the Diem government had reached a crisis within Vietnam and the M24s were used as shock vehicles to quell civil disturbances against the government. Eventually, M24s from Diem's Palace Guard and those of a number of rebel units fought a pitched engagement in November of 1963 which resulted in the overthrow of the Diem government. Successive Vietnamese leaders kept the M24s in reserve, using them to protect their hold on the government and to influence voters during national elections. As a result the M24 crews became known as 'coup troops' and their vehicles earned the nickname 'voting machines.'

During 1964 it was decided to replace the aging M24s in ARVN armored units with the newer M41 Walker Bulldog and the Chaffee gradually disappeared from the cavalry squadrons. A number of these vehicles were later used to guard important installations as static pillboxes within a fixed perimeter defense system. When used in this role the M24s usually had their engines removed. This was done for two reasons; first there was a shortage of spare parts to keep them running and secondly, high ranking Vietnamese officials did not want them being used against them in a possible coup.

One exception to this was a Vietnamese Air Force (VNAF) security unit of M24s stationed at Tan Son Nhut airport. These vehicles were kept operational on direct orders from the VNAF commander, General Nguyen Cao Ky. Their mission was the defense of Tan Son Nhut, however, their actual role was to protect the Ky regime from a possible coup attempt. These M24s were still operational during 1972 and may have taken some part in the last ditch fighting around Saigon during April of 1975**.

# Other Services

M24s were widely exported and have seen action in numerous countries. A number of M24s were used in both Laos and Cambodia throughout the Vietnam war, while Thailand has employed M24s on anti-guerrilla operations on its northern and eastern borders. In the Middle East, a number of Arab countries received M24s, however, there is no record of any of these vehicles being used in any of the major armor battles of the various Arab-Israeli wars. France employed a number of M24s withdrawn from Indochina on anti-guerrilla operations in Algeria and the Portugese used a number of M24s supplied under the US Military Assistance Program during their guerrilla war in Angola.

The last major action seen by the M24 was during the Indian-Pakistani war of 1971. Totally outclassed by Indian armor, mainly Soviet built T-55s and PT-76s, the Pakistani cavalry regiment in East Pakistan (now Bangladesh) lost all its M24s during the ensuing campaign.

On the lighter side the M24 has been a prominent 'star' in a host of Japanese 'Sci-Fi' films, battling a wide range of movie monsters. These M24s were provided courtesy of the Japanese Self Defense Force (JSDF) which received a number of M24s during the mid-1950s under the Japanese rearmament program. Long after the last remaining M24s have been consigned to scrap dealers, these M24s and others in the hands of movie makers will continue to delight audiences who flock to these films

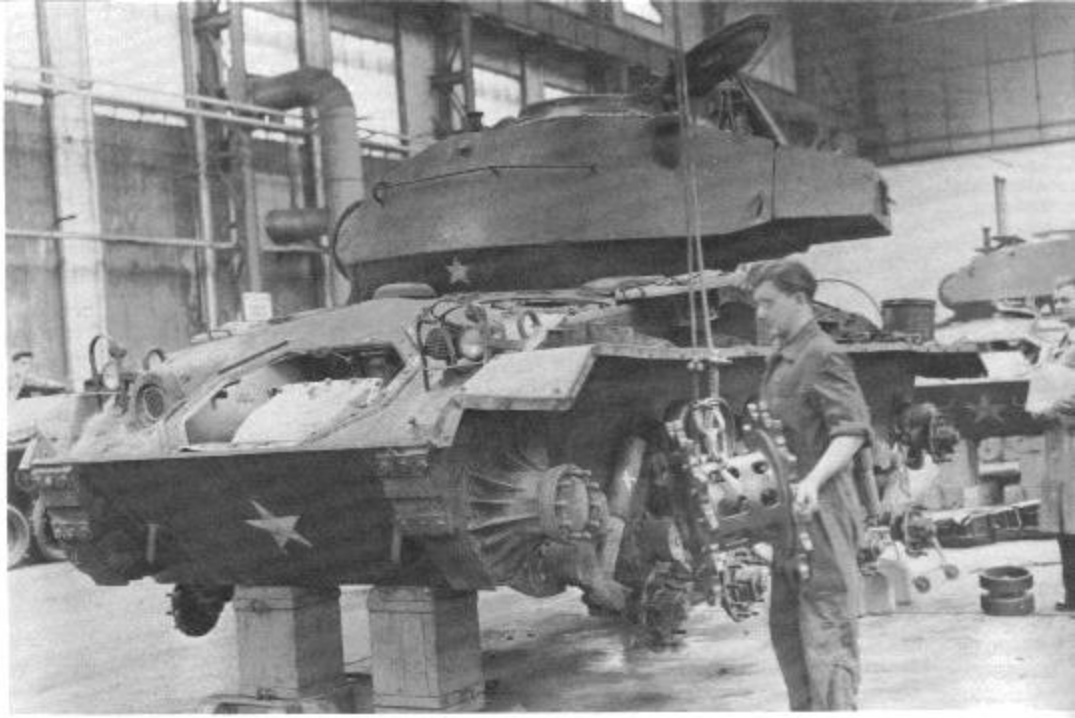


***French and later Vietnamese use of the M24 is covered in the author's "Armor in Vietnam" also from Squadron Signal.*

**This M24 has been outfitted with a hedgerow cutter, sandbags, and kill markings for a celebration of the founding of the cavalry held in the Panama Canal Zone. It is highly doubtful that any M24 was actually configured like this during WW II. (US Army)**

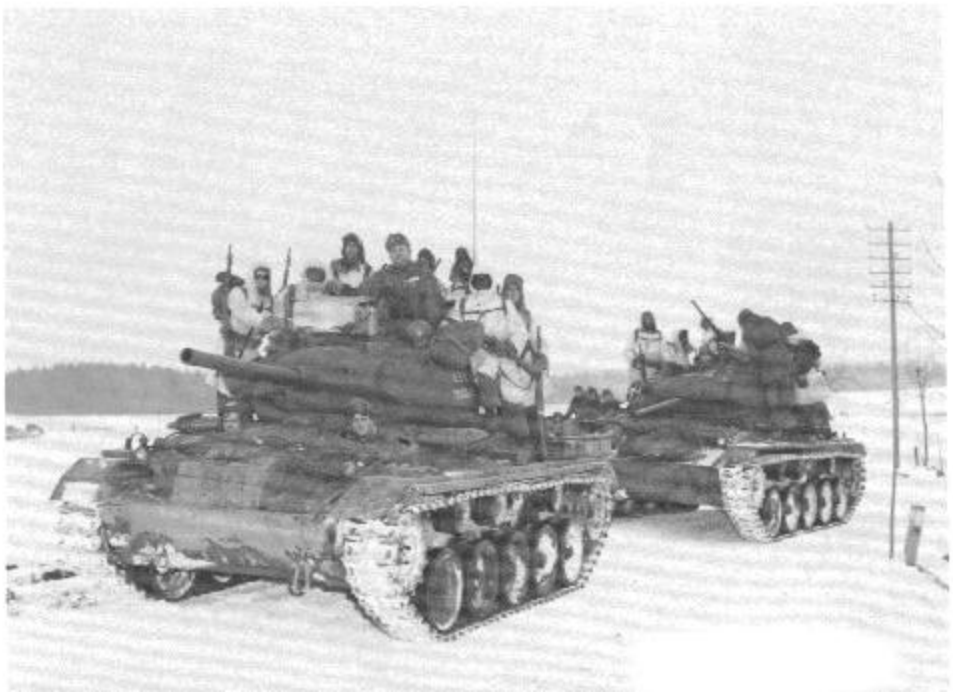
**Airborne forces used the M24 as part of their armor formations even though a fully loaded M24 could not be airlifted into action during an airborne assault. These members of the 504th Airborne Infantry Regiment are taking part in OPERATION SOUTHERN PINE, a joint Army-Air Force exercise held at Fort Bragg in the Summer of 1951. (US Army)**

Tankers of the 2nd Cavalry have painted this M24 with a coat of Whitewash to camouflage it against the snow covered countryside. The Chaffee has been modified with a rail mounted on the side of the turret to carry packs and other equipment. (US Army)



As the Chaffee was replaced in Europe by the M41 Walker Bulldog the M24s were overhauled and either returned to the US for the Army Reserve and National Guard or given to Allied nations. This Chaffee is being refurbished by German workers at the Butzbach Ordnance Depot in April of 1954. (US Army)

Infantrymen catch a ride on a pair of Chaffees during Exercise 'Snowshoe' held near Laufen, Germany in January of 1952. The placement of the vehicle serial number in White on the turret sides is unusual. (US Army)



This M24 lost a track near Regensburg, Germany while on company exercises. The large amount of extra gear carried on the vehicle indicates that the exercise was more than just a one or two day operation. (Guthrie via Harlem)

Continental units were the last to be re-equipped with the M41, keeping their M24s into the mid-1950s. *Anadarko* of the 81st Reconnaissance Battalion, 1st Armored Division, in New Mexico has been modified with a pintle mount for the .50 caliber machine gun on the front of the turret. (US Army)

US occupation forces in Japan were equipped with M24s because the Japanese roads and bridges could not stand up to heavier tanks. These M24s of the 22nd Ordnance Battalion are undergoing maintenance by Japanese workers at a depot near Tokyo during the spring of 1949. (US Army)

*CLEO* an M24 of the 196th Regimental Combat Team, US Army Reserve advances through heavy brush during summer training exercises at Fort Richardson, Alaska. While in Alaska the unit took part in live fire training with its M24s. (US Army)

An M24 of the 24th Reconnaissance Company waits for orders along a South Korean road in June of 1950. When the North Koreans invaded the South, American troops and equipment were rushed to the country from Japan. These forces included Chaffees of the 24th Recon Co., 24th Infantry Division. (US Army)

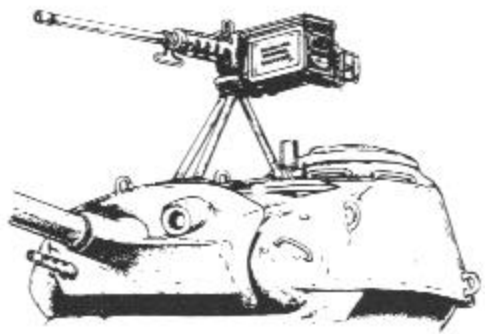
The crew of *REBEL'S ROOST* an M24 of the 24th Recon Co. were credited with the destruction of a North Korean T34 of the 197th Tank Regiment on 10 July 1950. In this engagement near Chonui two other M24s were lost. (US Army)

As the fighting shifted in favor of the UN forces M24s were used for scouting and protecting the flanks of armored columns pushing out of the Pusan Perimeter. This M24 has been modified with a pintle mount for the .50 caliber machine gun on the front of the turret roof. (JEM Aviation)

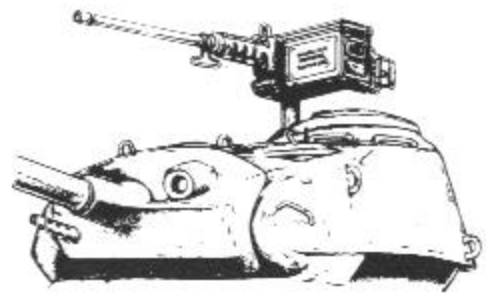
Members of the 27th Maintenance Company work on an M24 damaged during the fighting around Yongdong in the late summer of 1950. Enemy action, lack of adequate maintenance, and the dusty conditions in Korea all took their toll of M24s. (US Army)

## Field Installed Commander's Machine Gun

**Tripod Style Mount**



**Pintle Style Mount**



*EAGLE CLAW*, an overall Olive Drab M24 of the 3rd Reconnaissance Company, 3rd Infantry Division near Sougboug-dong Korea during May of 1951.

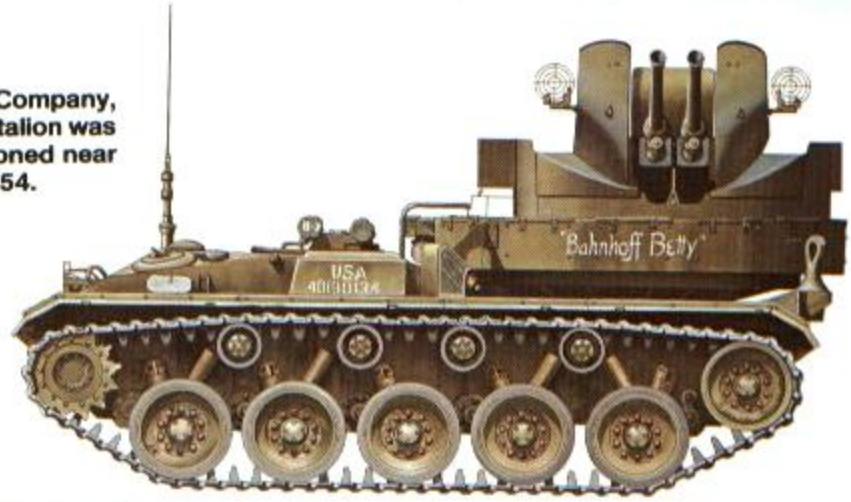
This M24 of the 187th Airborne Regimental Combat Team at Youg-dong-po, Korea during April of 1951 carries the Airborne crest of a White parachute with Gold wings on the turret side.

*HANK SNOW* an M24 of the Headquarters Company, 6th Cavalry stationed in Ragensburg, West Germany near the Czechoslovakian border in June of 1952.

An M41 Howitzer Motor Carriage of the 999th Field Artillery Battalion, 24th Infantry Division near Yaugpyung Korea in March of 1951.

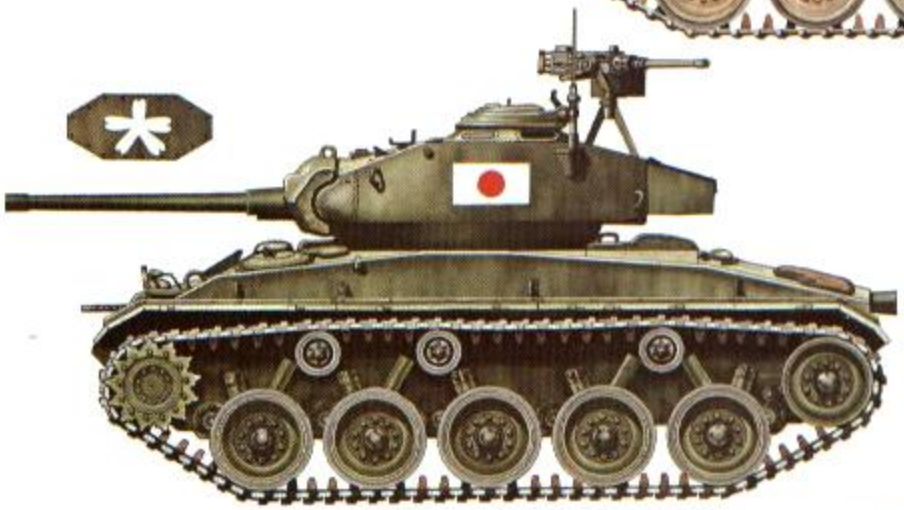
*For HELL FIRE*, an M37 HMC of the 58th Field Artillery Battalion, 3rd Infantry Division, stationed near the Imjin River in Korea during April of 1951.

*Bahnhoff Betty*, an M19 of B Company, 46th Anti-Aircraft Artillery Battalion was part of the NATO forces stationed near Hanau, Germany in May of 1954.



***BONAFIDE***, an M37 of Battery B, 3rd Armored Field Artillery Battalion was part of the American Forces stationed at Heidelberg, Germany during March of 1953.

This M24 named *SMOLENSK* was attached to the *Escadron de Marche du 1er, Regiment de Chasseurs a'Cheval, Platoon Guntz* at Dien Bien Phu in May of 1954.



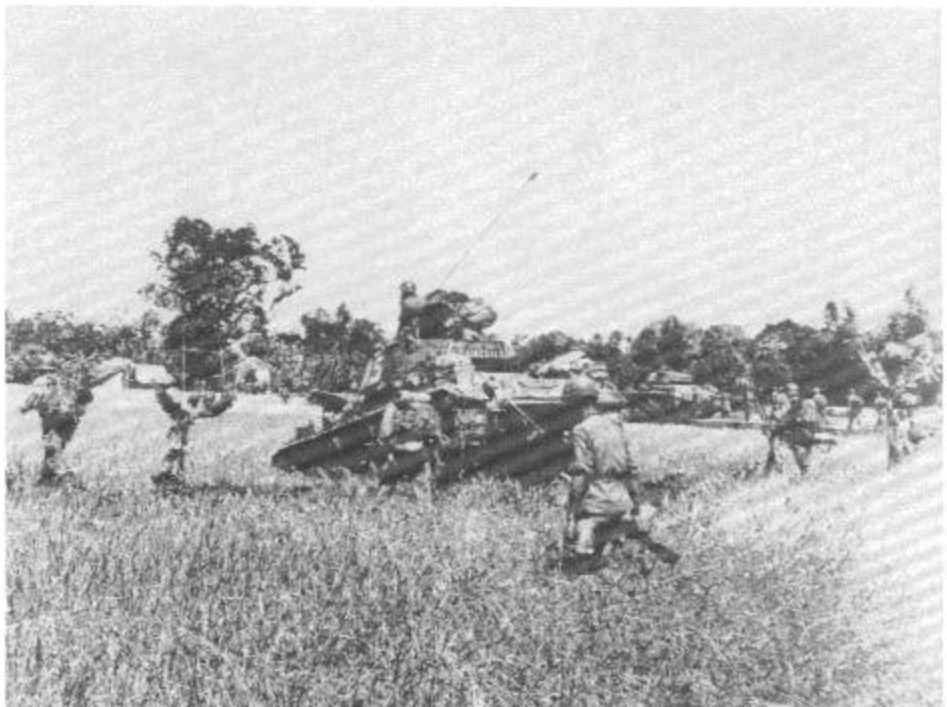
M24s of the 6th Division, Japanese Self Defense Force carried the Japanese flag painted on the turret and a White flower painted on the glacis plate.

A camouflaged M24 of the 29th Cavalry Regiment, Pakistani Army during the fighting in Decca, East Pakistan during the Indian-Pakistani war of 1971.

*VIENNE* an M24 of the 1st RCC crosses a jungle clearing during OPERATION LORRAINE in late Fall of 1952. French crews named their tanks after famous battles, with the tanks of each squadron having names beginning with the same letter. The crew of this vehicle have bolted upright sheet metal to the right fender to make more room for storage. (ECPA)

A mixed column of M24s and M5s move along a crowded road in Northern Vietnam. During 1950 French armored units in Indochina began receiving M24s to replace their aging M5 Stuarts. The M24 White US star on the engine deck of the lead M24 has not yet been over-painted. (ECPA)

M24s escort infantry across a rice paddy during OPERATION MOUETTE in Pho Nho Quan province during the Fall of 1953. The low ground pressure of the Chaffee made it ideal for operations in the swamps and rice paddies of Indochina. It could often go into areas that would have bogged down an M5.



French troops, supported by an M24, search a village for signs of the Viet Minh. French commanders parcelled out M24s and other armor in small numbers to many units and were not able to employ armor in a concentrated manner when the enemy was found.

When the French withdrew from Indochina, the South Vietnamese Thu Duc Armor School was equipped with a number of M24s for training with the assistance of American instructors. These M24s of the Armor School are camouflaged in a pattern of Reddish Brown, Olive Drab, and a lighter shade of Green. (US Army)

This M24 was part of the rebel forces that overthrew Ngo Diem in November of 1963. The M24s were kept under the direct control of various government leaders in Saigon to quell civil disturbances, becoming known as 'voting machines' while crews were nicknamed 'coup troops.' (US Army)

This M24 is being used as a pillbox near a U.S. base during the late 1960s. As the Chaffees were replaced by M41 Walker Bulldogs they were turned into permanent pillboxes along base perimeters. Their engines were removed because of a lack of spare parts and to eliminate any possible use in a coup. (Harvey via Bradford)

M24s of the South Vietnamese Air Force (VNAF) base security troops were kept operational and saw action during the 1968 TET Offensive around Tan Son Nhut airbase. This VNAF M24 has teamed with US Air Force security units to drive Viet Cong sappers from captured positions on the perimeter of Tan Son Nhut. (USAF)

When the author was in Vietnam (from late 1971 until the Summer of 1972) he saw a number of operational VNAF Chaffees stationed at Tan Son Nhut air base for perimeter defense. These M24s initially were camouflaged in a pattern of Dark Olive Drab and Tan. (Mesko)

M24s roll down the *Champs Elysee* during a parade to celebrate French Independence. Aside from their combat use in Indochina, the French also used M24s to rearm French Army armored units in Metropolitan France immediately after World War II.

During the later part of the author's tour in Vietnam the VNAF M24s were repainted in a new camouflage scheme of Lime Green and Black. These VNAF M24s were the last operational M24s in Vietnam. (Mesko)

As the European nations rebuilt their armed forces after the Second World War, M24s were supplied under the American Military Assistance Program (MAP). This group of Dutch tankers are instructed on the operation of their newly acquired Chaffees. The Netherlands received approximately fifty M24s during the early 1950s.

The crew of this Greek Army M24 listens to an officer brief a group of visiting NATO officers prior to beginning a joint NATO exercise. The M24 is marked with a small Blue crest with a White cross on the side of the turret. This marking was similar to the Greek flag.

A group of Iranian Army personnel receive instruction on how to change the engine of the M24 from an American instructor. The Chaffee was relatively simple to maintain making it an ideal armored vehicle for nations with little experience with armor. (US Army)

When the Japanese began to rearm after the Korean War a number of M24s were refurbished and provided to the Japanese Self Defense Force. These became popular 'actors' in a host of monster movies made in Japan during the late 1950s and early 1960s. (Foss)

Indian troops pose on top of a disabled Pakistani M24 in East Pakistan during 1971. Pakistani M24s of the 29th Cavalry were the only armor available in East Pakistan (Bangladesh). The M24s were outgunned by the Soviet-built T55s and PT76s of the Indian Army and all units were lost during the fighting.

# Light Combat Team

Parallel with the development of the M24, the Army began development of what was termed the 'Light Combat Team'; a series of self-propelled guns and special purpose vehicles developed from the M24 chassis. By using the engine, power train, and suspension of the M24 it was felt that production, maintenance and spare parts acquisition would be greatly simplified. Under this concept six vehicles were designed and tested, with three entering production and service.

# M19 Motor Gun Carriage

The M19 Gun Motor Carriage (GMC) was the first vehicle to be designed using the chassis of the M24 under the 'Light Combat Team' concept. The prototype borrowed a great deal of technology from an earlier anti-aircraft vehicle which had been based on the M5A1 Stuart chassis. The M5A1 anti-aircraft vehicle had featured a lengthened chassis with a twin 40MM M2 Bofors anti-aircraft gun mounted in a open gun tub at the rear of the vehicle. Designated the T65, the prototype had passed acceptance testing, however, the introduction of the M24 led the Army to abandon the project in favor of a similar conversion based on the M24 chassis.

During mid-1943 the Ordnance Department began a redesign of the T65 utilizing an M24 chassis. The rear mounted gun tub made it necessary to relocate the engine compartment and power train of the M24 to the middle of the vehicle. The forward crew compartment, with the driver and assistant driver positions, was retained unchanged, however, the rear mounted gun tub lengthened the overall vehicle slightly.

The main armament consisted of twin 40MM M2 Bofors automatic cannons. These were selected over other possible armament combinations because the Army Anti-aircraft Command wanted a heavier weight of fire then was possible with either a multiple .50 caliber machine gun mount or multiple 20MM cannon mount. The M2 Bofors had proven to be a highly reliable, fast firing weapon which seemed ideally suited for the mobile anti-aircraft role. The turret was capable of full 360 degree traverse while the guns could elevate plus 8 degrees and depress minus 5 degrees. The guns were manually loaded by the four man turret crew using four round ammunition clips. The vehicle could carry up to 336 rounds of ammunition internally and could tow a special ammunition trailer with additional ammunition. The hull mounted .30 caliber machine gun was deleted, although provision was made for an external machine gun mount and internal storage for personal weapons (usually four .30 caliber carbines and one .45 caliber submachine gun) to provide close in defense.

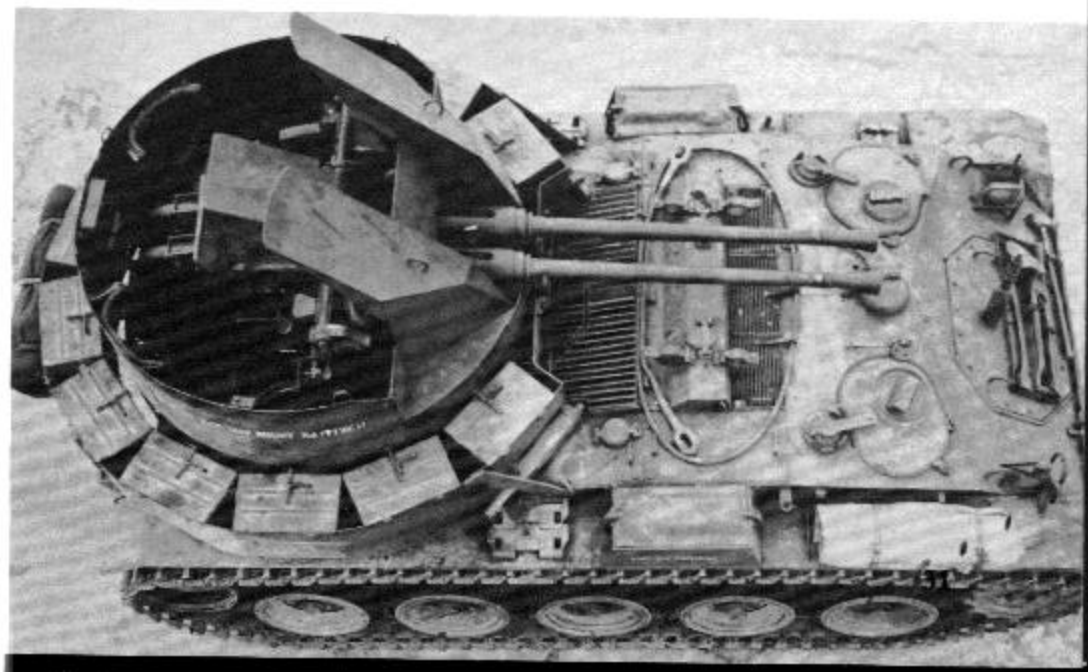
The prototype, designated T65E1, began testing in early 1944. Trials held at Aberdeen proved satisfactory with the prototype demonstrating a top speed of 35 mph and a range of 100-160 miles. In August of 1944 the Army issued a contract for 904 vehicles to be built by Cadillac and Massey-Harris under the designation M19. Production quickly went into full swing with a total of 285 M19s being produced before production was cut back with the end of the Second World War. Introduced too late to see service in World War II, the M19 became the standard post-war anti-aircraft vehicle assigned to Army armored divisions.

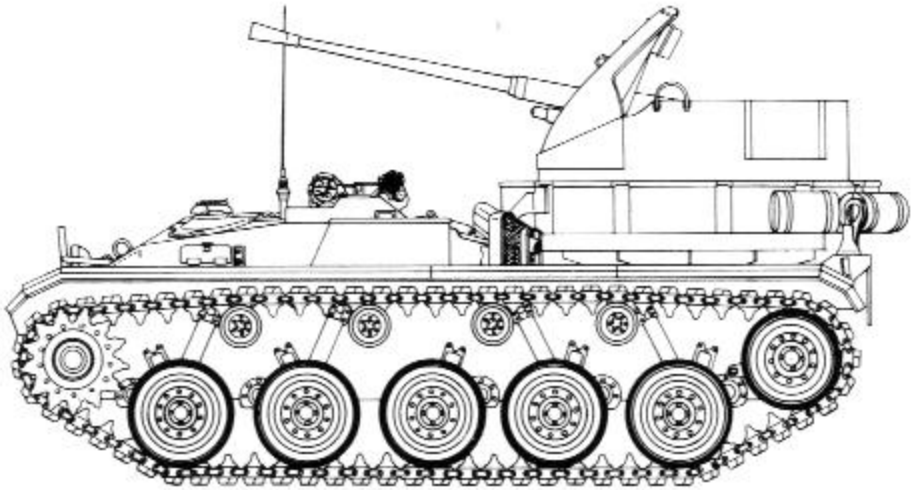
The M19 saw extensive service during the Korean War. The lack of enemy aerial opposition allowed the M19 to be used primarily as an infantry support weapon where it proved to be extremely effective. In the direct fire support role, in both attacks on prepared enemy positions and as a defense weapon, the heavy firepower of the M19 was used with devastating effect. M19s were especially useful in halting enemy 'human wave' attacks on UN positions.

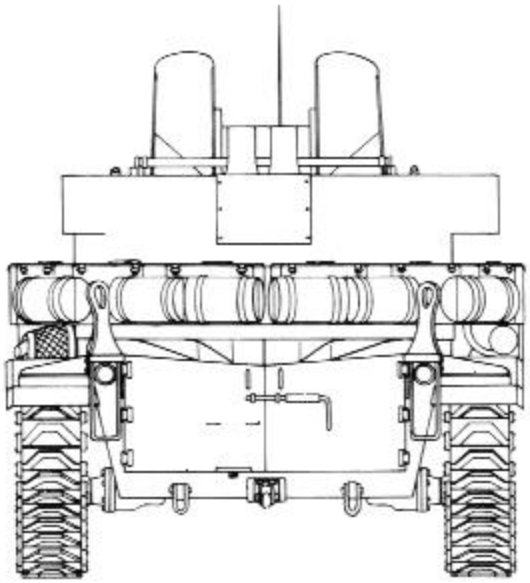
**The M19 used much of the technology developed for the earlier T64 Gun Motor Carriage. The 40MM gun mount and vehicle layout were similar to the M19.**

Later, when the war settled into a more or less static positional type of conflict the M19 gave reliable support to many an embattled hilltop infantry position. M19s were called upon to suppress enemy fire from well fortified front line Chinese and North Korean positions, firing a mix of tracer, explosive, and incendiary rounds. After the cease fire the M19 was gradually replaced with more modern equipment with a number of now surplus M19s being turned over to US allies, while others were scrapped.

**The T65E1 prototype anti-aircraft vehicle carried twin 40MM Bofors cannons mounted in a fully traversable turret on the rear of a modified M24 chassis requiring the relocation of the engine to the middle of the hull.**

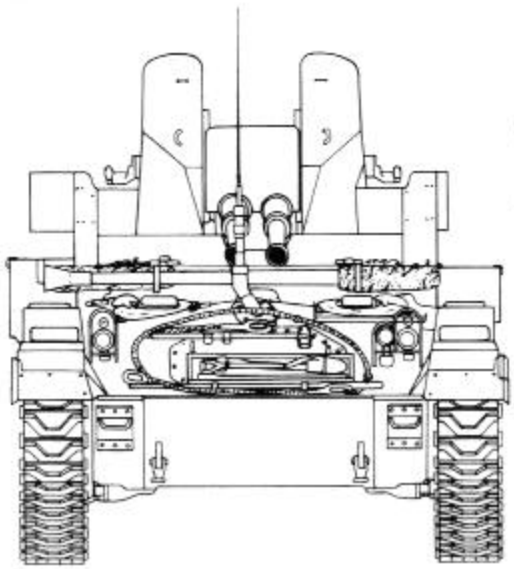


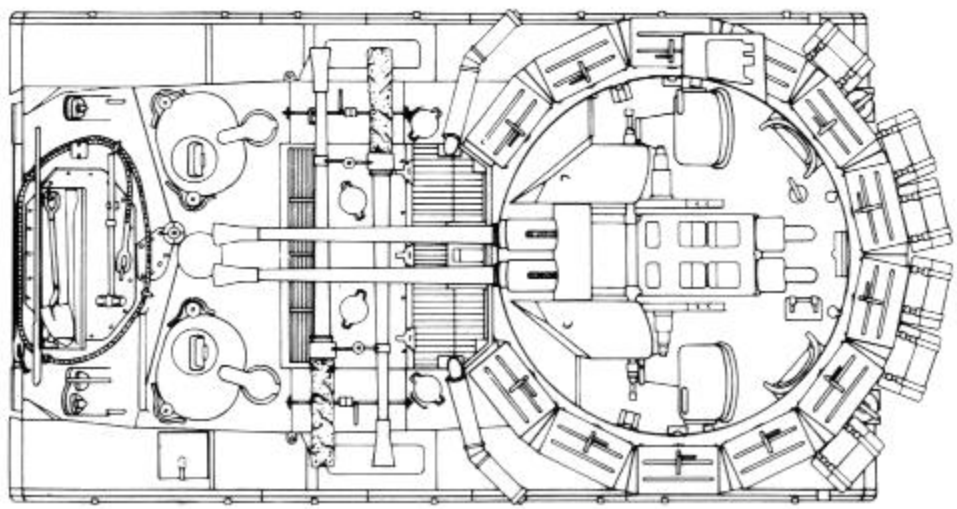




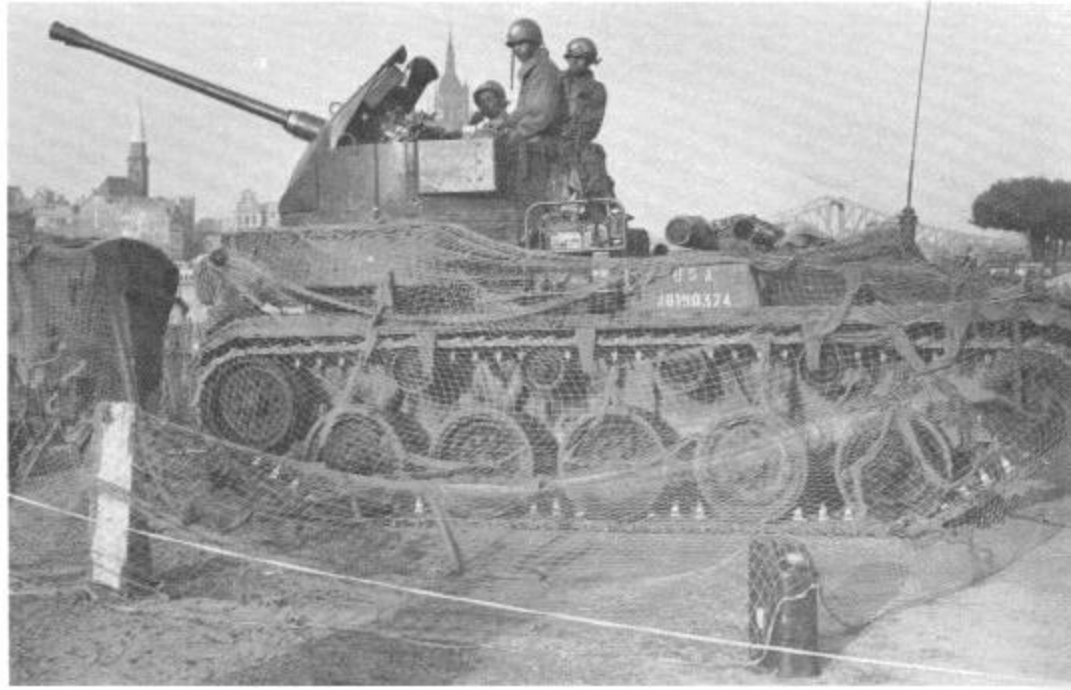
# SPECIFICATIONS
## M19 40mm Gun Motor Carriage

| | |
|---|---|
| **Length** | 17 feet 11 inches |
| **Height** | 9 feet 9 ½ inches |
| **Width** | 9 feet 4 inches |
| **Ground Clearance** | 17 inches |
| **Maximum Weight** | 38,500 pounds |
| **Powerplants** | Two Cadillac V8 gasoline engines |
| **Armament** | |
| **Main:** | Two 40mm Bofors cannon |
| **Secondary:** | Provision for one pintle mounted .50 caliber machine gun |
| **Performance** | |
| **Maximum Speed** | 35 mph |
| **Range** | 100-160 miles |
| **Crew** | Six |





The M19 was a well designed, powerful armored anti-aircraft vehicle, however, the advent of jet aircraft made the vehicle obsolete, since the slow traverse of the turret made it impossible to track high speed jet aircraft.



The crew of this camouflaged M19 are part of the defending force in Exercise 'Combine' held in Frankfurt, Germany during 1951. (US Army)

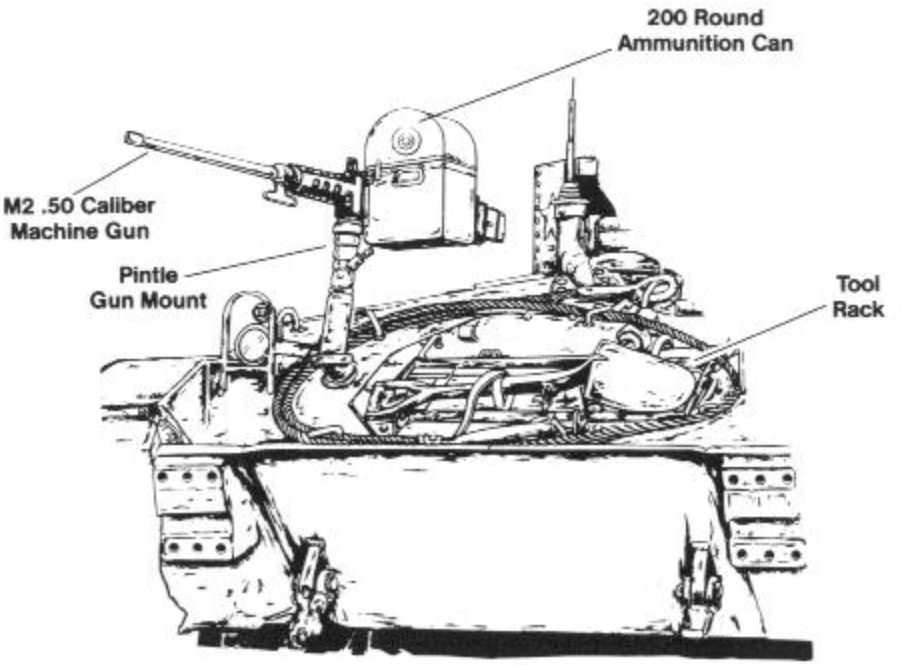
It was common practice in both self-propelled artillery and anti-aircraft units to name their vehicles with names based on their battery letter. These crewmen work on the running gear of *Arthritis*, an M19 of Battery 'A', 94th Anti-aircraft Artillery Battalion. (US Army)

The side skirts around the lower portion of the turret held ammunition boxes with a capacity of 336 rounds of 40MM ready ammunition. Additional ammunition was housed in a one ton ammunition trailer towed behind the M19.

Enemy air activity over Korea was limited and self-propelled anti-aircraft vehicles were pressed into service in the fire support role. This M19 crew covers a portion of the Naktong River during the fighting to hold the Pusan Perimeter in July and August of 1950. (US Army)

When the Chinese entered the war during the Winter of 1950-1951 the high rate of fire of the M19 was found to be highly effective against Chinese human wave attacks. This camouflaged M19 of Battery C, 82nd Anti-aircraft, 37th Field Artillery, 2nd Infantry Division tows a one ton ammunition trailer behind it. (US Army)

## Glacis Plate .50 Caliber Machine Gun Mount

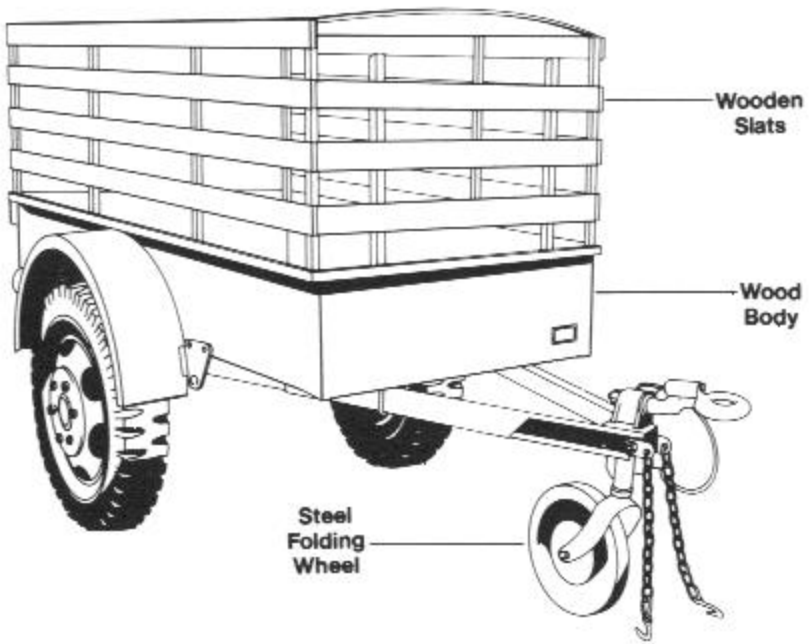


The gunner on this M19 of the 187th Regimental Combat Team, watches communist activity on a distant hill near his position during the Spring of 1951. The presence of an M19 would often deter enemy attacks during daylight hours. (US Army)

The crew of this M19 of the 3rd AA Battalion fire on communist positions just south of the 38th Parallel during May of 1951 while two M4 Sherman medium tanks stand by in case the heavier firepower of their 76MM guns is needed. (US Army)

An M19 towing a 1 ton ammunition trailer moves toward the 38th Parallel while on maneuvers with the 3rd Infantry Division during early 1954. M19s remained in US Army service longer then the M24 because there was no immediate replacement available. (US Army)

## 1 Ton Ammunition/Cargo Trailer



# M41 Howitzer Motor Carriage

Similar to the M19, the M41 could also trace its ancestry back to a project designed around M5A1 components. The original pilot vehicle, with the engine moved to the middle of a lengthened chassis, had been designated T16 and was armed with a 4.5 inch gun. A second trials vehicle was also authorized, with this vehicle being armed with a 155MM howitzer under the designation T64. Both vehicles entered testing during 1943 and following completion of these tests, both basic designs were approved.

With the introduction of the Light Combat Team concept, the Army decided that both vehicles should be revised to utilize the M24 chassis in place of the M5A1 chassis. Under this program the T16 became the T16E1 while the T64 became the T64E1. The Armor Board, however, eventually rejected the 4.5 inch gun and the T16E1 was cancelled before the pilot vehicle was completed.

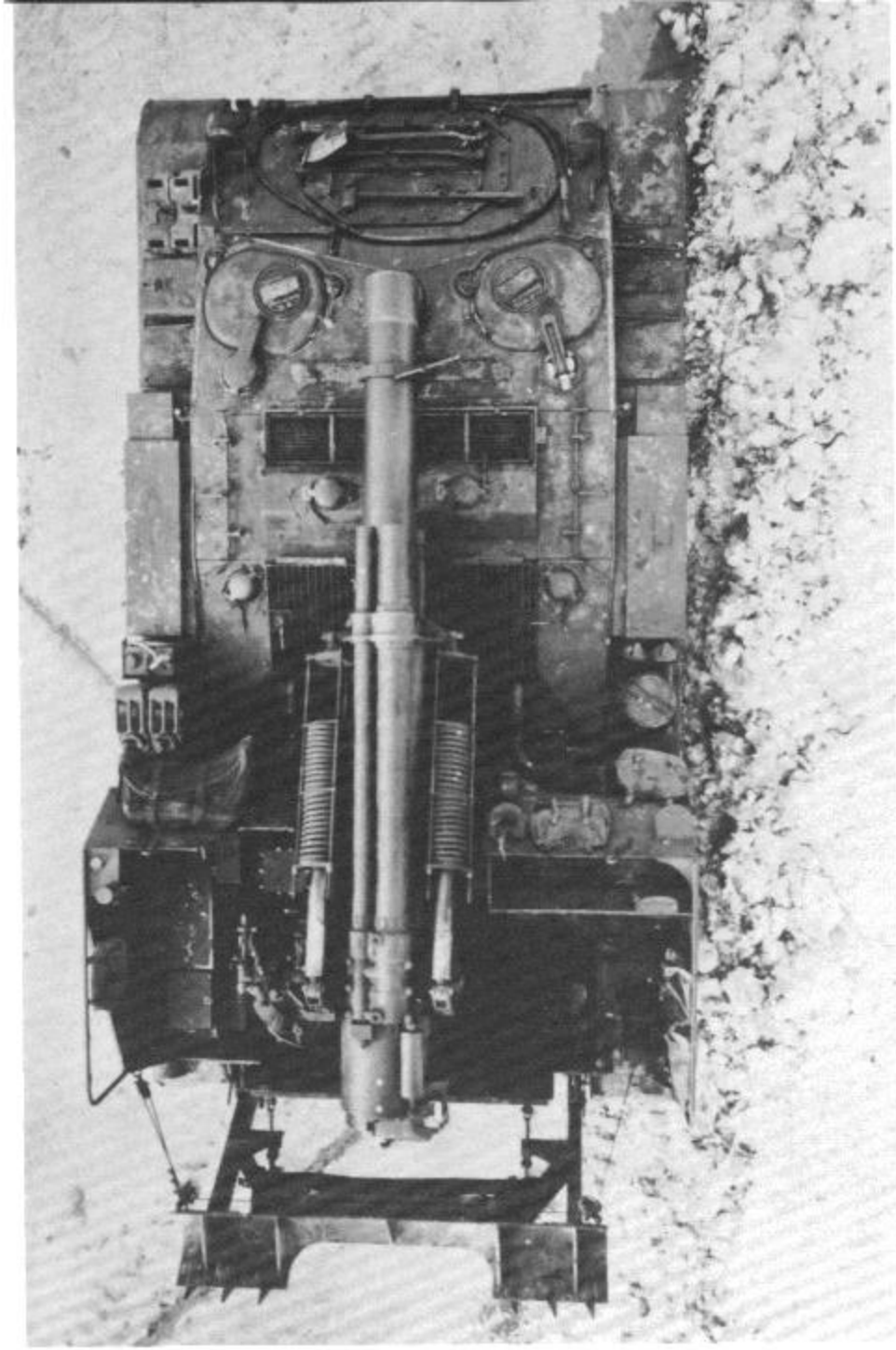
Development of the T64E1 continued using M24 components and by early 1945 the prototype was ready for testing. This vehicle was almost identical to the M19 anti-aircraft motor gun carriage, except for the gun, gun mount, and fighting compartment. The forward positioned drivers compartment remained basically unchanged from the M24, while the engine and power train were moved forward to the center of the vehicle. The forward facing 155MM M1 howitzer was mounted low in the rear of the vehicle. The gun mount allowed the gun to be traversed to either side of the vehicle (20½ degrees to the right and 17 degrees to the left) while the gun tube could be elevated 45 degrees and depressed 5 degrees. A manually operated recoil spade could be lowered from the rear of the vehicle to help absorb the recoil of the howitzer, while a folding platform on top of the spade gave the gun crew additional space to work. Provision was made for internal storage of twenty-two rounds of 155MM ammunition as well as ammunition for the crew's personal weapons (two .45 caliber submachine guns and three .30 caliber carbines). It was planned that additional ammunition for the howitzer would be carried in an accompanying T22E1 ammunition/cargo carrier, however, the T22E1 carrier project was cancelled in January of 1944. In service, extra ammunition for the vehicle was carried in armored trailers, or M39 utility vehicles.

Development testing of the T64E1 revealed no major flaws in the design and in May of 1945 a contract was approved for 250 production vehicles under the designation M41 Howitzer Motor Carriage (HMC). Sixty were completed by Massey Harris before the end of the Second World War brought a cancellation of the remaining vehicles. Unofficially nicknamed the 'Gorilla,' the M41 was issued to various self propelled artillery units in the post-war army.

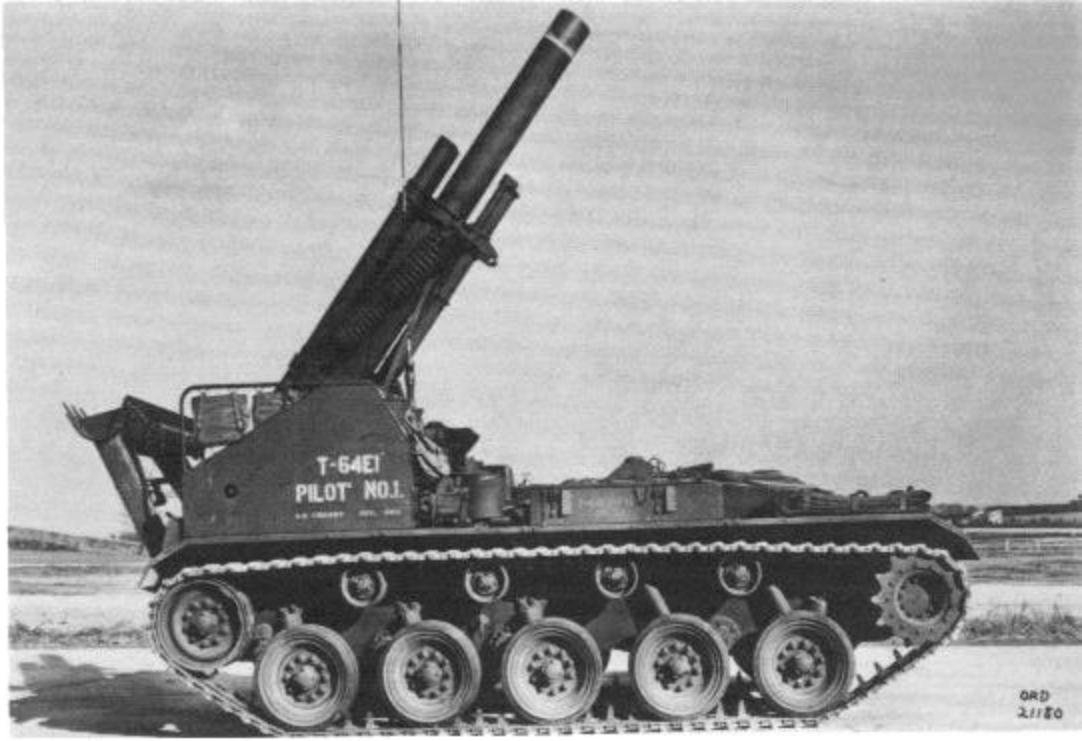
M41s saw extensive action in Korea where self propelled artillery was used with telling effect against massed Chinese troop formations. The mobility of the M41 allowed them to accompany the infantry providing direct fire support when needed, often making the difference between success or failure of an operation. Once the war had settled into a static type of warfare, the M41s were often used as conventional field artillery, firing from prepared camouflaged positions. Their mobility in this type of warfare was an added benefit, since they were able to easily change locations if the enemy zeroed in on their positions and began counter-battery fire against them. M41s of the 92nd Field Artillery Battalion, the *Red Devils* set several records, firing the 150,000th and 300,000th round of artillery fire against the communists.

M41s remained in service with Army Field Artillery units well into the mid-1950s, when they were finally retired and scrapped.

**The recoil spade was manually operated and in the lowered position formed a base for a work platform which give the crew needed working space. The gun could traverse 37 degrees and elevate 45 degrees. Storage racks for ammunition are mounted directly under and to either side of the gun.**

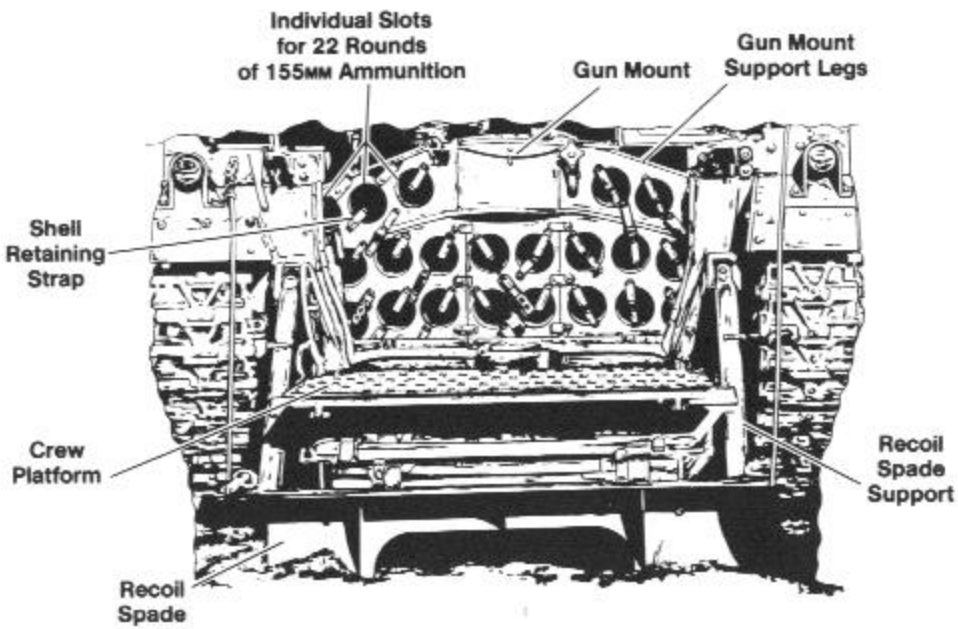


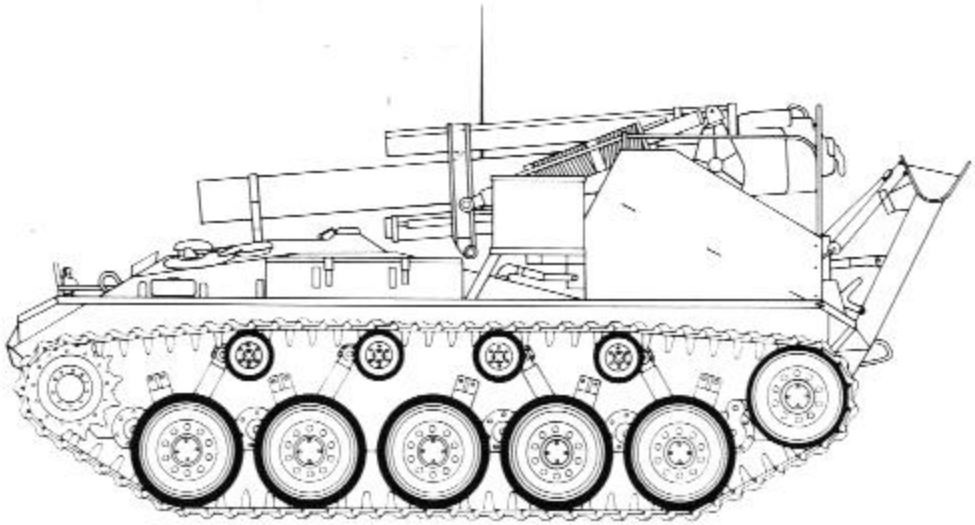
With the gun mounted at the rear of the vehicle the engine compartment was repositioned to the middle of the chassis. This M41 parked alongside an embankment reveals the gun elevation system and engine decking.

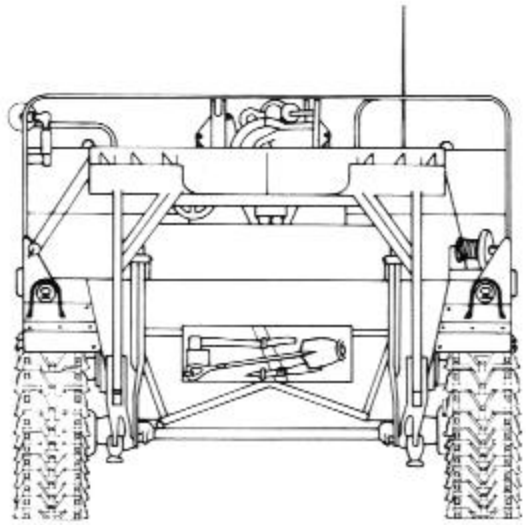



The T64E1 pilot vehicle differed little from the production M41 Howitzer Motor Carriage (HMC). Designed under the Light Combat Team concept, the vehicle was relatively compact even though it mounted a large 155MM howitzer.

## M41 Ammunition Storage

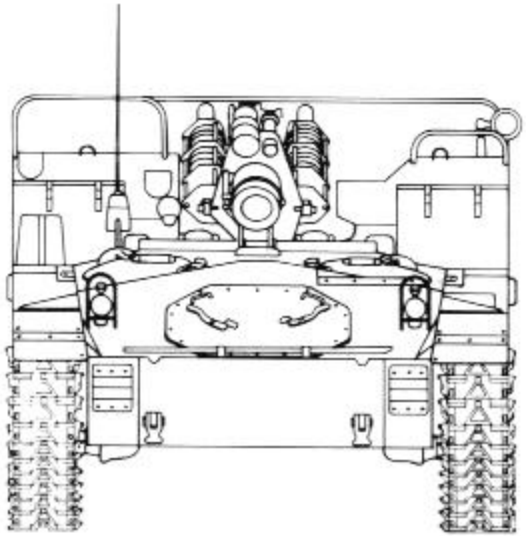


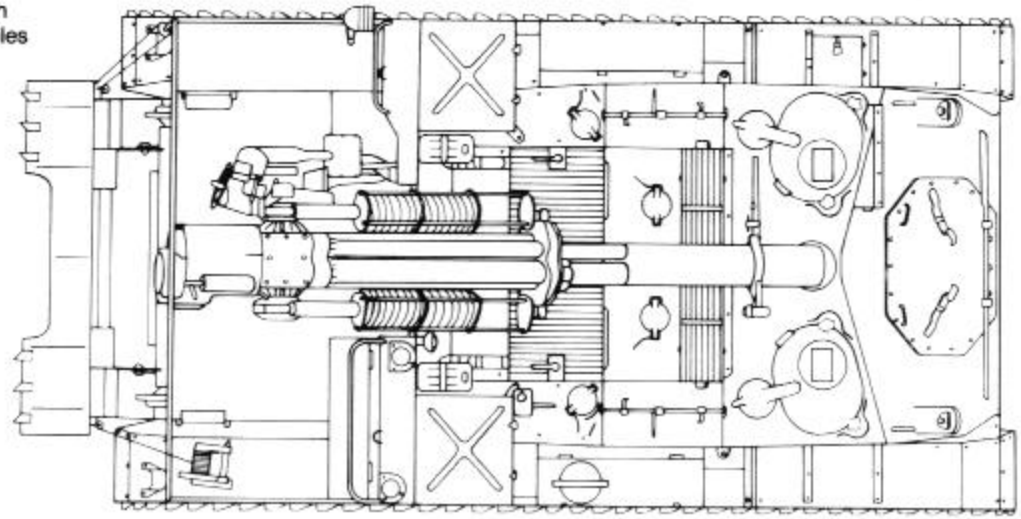




# SPECIFICATIONS
## M41 Howitzer Motor Carriage

| | |
|---|---|
| **Length** | 19 feet 2 inches |
| **Height** | 7 feet 10 inches |
| **Width** | 9 feet 4 inches |
| **Maximum Weight** | 41,000 pounds |
| **Ground Clearance** | 17 inches |
| **Powerplant** | Two Cadillac V8 gasoline engines |
| **Armament** | |
| **Main:** | One 155MM cannon |
| **Performance** | |
| **Maximum Speed** | 35 mph |
| **Range** | 150 miles |
| **Crew** | Five |





M41s of the 92nd Field Artillery are moved into position for a fire mission in support of the 7th Infantry Division at Kamhong, Korea on 2 December 1950.

An M41 of Battery A, 92nd Field Artillery Battalion fires from an open position against Chinese troops near Songdong on 21 January 1952. Unlike towed artillery M41 could be set up quickly with a minimum of preparation, allowing them to quickly shift position as the situation demanded. (US Army)

As the front stabilized, more protected positions were established for mobile artillery units. This M41 of Battery B, 999th Armored Field Artillery Battalion has a partial sandbag bunker and camouflage netting to provide a degree of protection and concealment. (US Army)

The French Army also received a number of M41s from the Military Assistance Program during the late 1950s. These were used for a relatively short period of time before being replaced by a vehicle of French design based on the chassis of the French AMX 13 light tank.

# M37/T38

The third vehicle built under the Light Combat Team concept was a self-propelled howitzer replacement for the M7 Priest 105MM self-propelled howitzer. The Priest, which had been a very successful vehicle, was based on M4 Sherman components. The army felt that medium tank chassis would be better used for tank production rather than self-propelled guns, especially one mounting such a relatively light weapon. As a result a new design was developed, very similar in layout to the M7 but based on the M24 chassis. The pilot vehicle, designated the T76, was completed and began testing during mid-1944.

The general chassis layout was similar to the M24, with the engine compartment in the rear. The fighting compartment was similar to the M7, although somewhat wider giving the seven man crew greater working space. The main armament, an M4 105MM howitzer equipped with an armored gun shield, was mounted in the fighting compartment just behind the driver's position. The assistant driver's position was replaced with a 'pulpit' gun position for an M2 .50 caliber heavy machine gun mounted on a ring mount for anti-aircraft and close in defense. Additionally, provision was made for internal stowage of six .30 caliber carbines and one .45 caliber submachine gun and their ammunition for the crew. Unlike the Priest, the main gun mounting allowed a wide field of fire (22½ degrees to either side) cutting down the need to move the vehicle to engage different targets.

Internal ammunition storage was increased over the M7 with the T76 being able to carry ninety rounds of 105MM ammunition (compared to sixty-nine rounds for the M7). Armor protection was increased being half inch steel on the front, sides and rear of the vehicle. These improvements gave the T76 greater fire power and better survivability. Tests with the T76 revealed a speed of 35 mph and a range of 100-150 miles, which were substantially better than the earlier M7. Following testing at Aberdeen, a contract was awarded to American Car and Foundry in January of 1945 for 448 vehicles under the designation M37 Howitzer Motor Carriage (HMC). With the end of the Second World War this contract, like those for the M19 and M41 was reduced. In the event, 316 M37s were completed, a number of which were built by Cadillac who had taken over part of the M37 contract from American Car and Foundry.

With the M37 the Army had a lighter, faster, more mobile, and less expensive vehicle than earlier 105MM howitzer motor carriages. The interchangability of chassis parts with the M24, M19, and M41 cut the costs of spare parts and made supply inventories far easier to control. Like the earlier vehicles of the Light Combat Team, a number of M37 were supplied to Allied nations under the Military Assistance Program while others went to US Army Reserve and National Guard units.

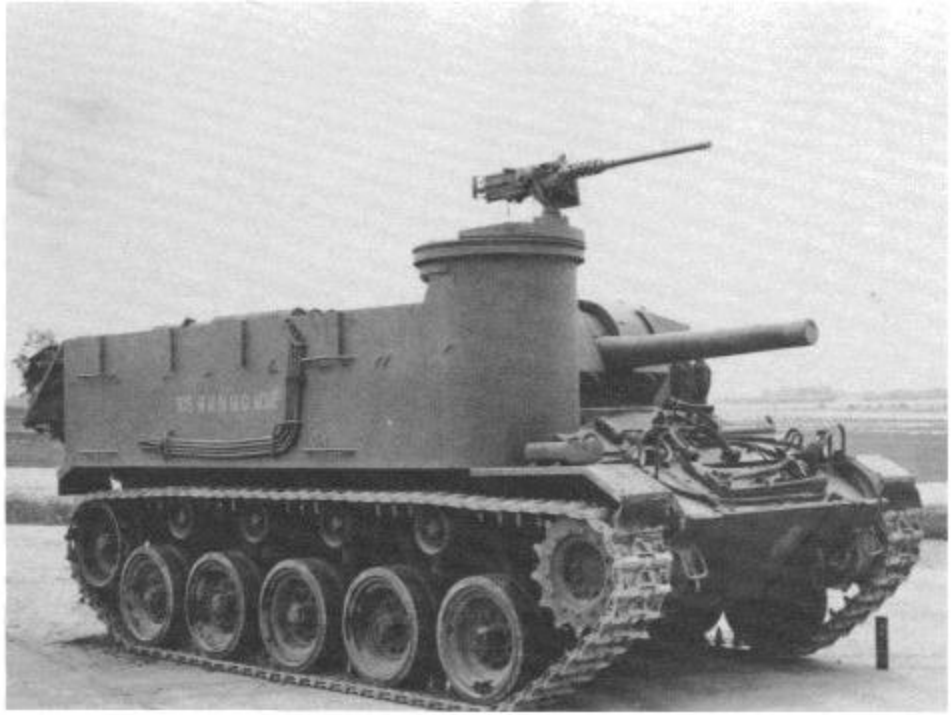
M37s formed an important part of the UN war effort in Korea where they fought alongside M7 Priests. Like the M41, the M37s were used as fire support vehicles to support infantry and to bombard enemy positions. After Korea the M37s were rapidly withdrawn from service as they were replaced by newer self-propelled guns with better protection for their crews.

## T38 Mortar Carrier

An off-shoot of the M37 HMC was the T38 mortar carrier which used an M37 chassis to carry a mortar tube and crew. The 105MM gun assembly was removed from the fighting compartment and the barrel opening in the superstructure covered over with armor plate. Provision was made for mounting a forward facing 4.2 inch mortar in the fighting compartment. The mortar could be fired from the fighting compartment, or from the ground by use of a base plate that was normally carried on the outside of the vehicle. One pilot vehicle was completed before the war ended and the project was cancelled.

**The M37 was intended to replace the M7 Priest in Army self-propelled artillery units. This M7 Priest rolls through the streets of Sciasca, Sicily on 23 July 1943 during the Sicilian campaign. (US Army)**

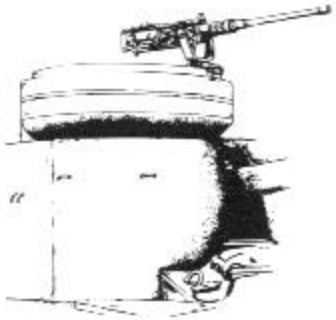
**The first T76 pilot vehicle underwent acceptance tests at the Army Proving Grounds at Aberdeen Maryland during mid-1944. The prototype proved so successful that it differed little from the production M37 Howitzer Motor Carriage (HMC).**



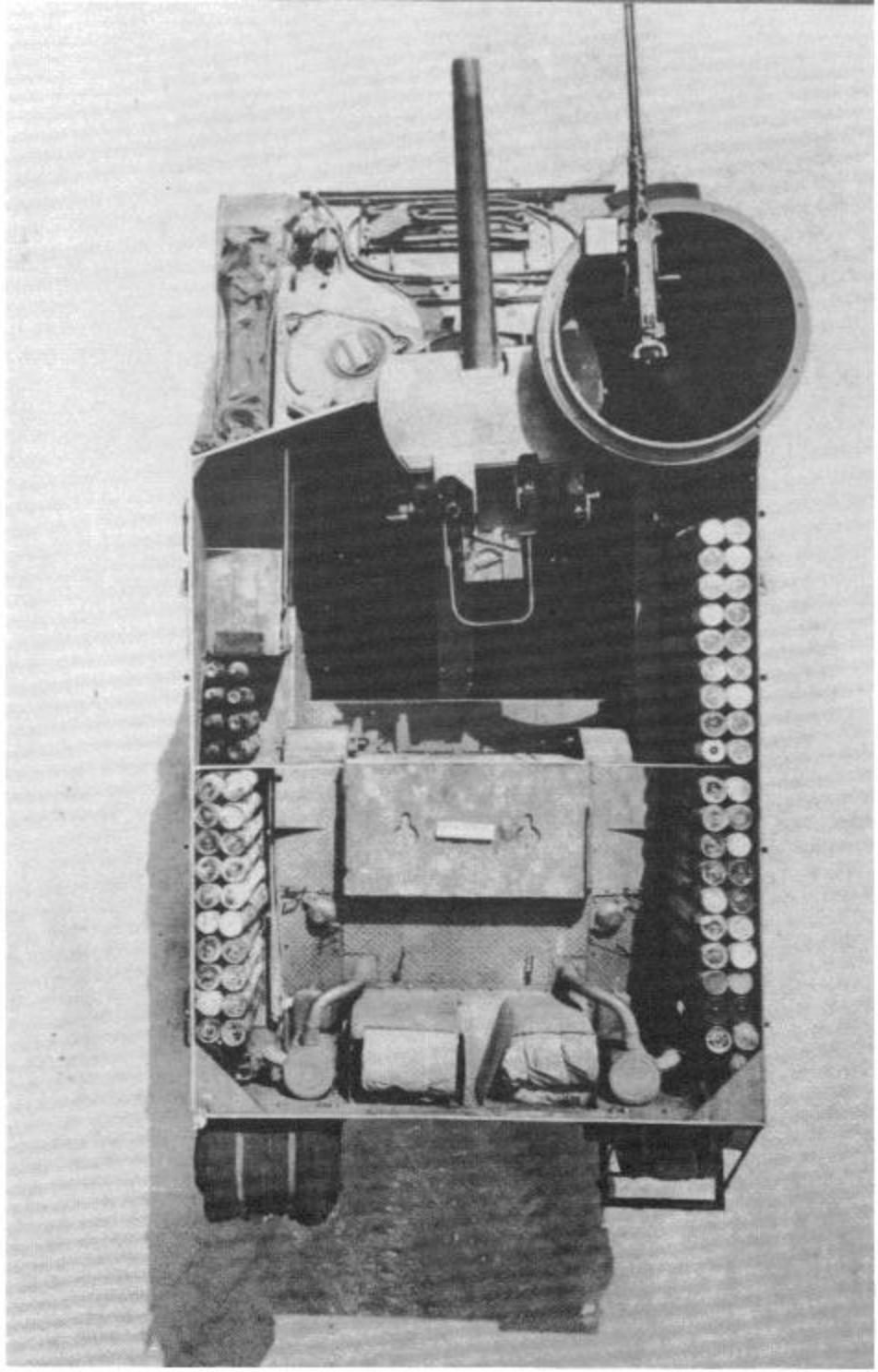
Production M37 HMCs featured a revised ring mount for the M2 .50 caliber anti-aircraft machine gun. This revised mount was the major external difference between the prototype T76 and the production M37.

## Machine Gun Pulpit

**T76 Prototype**

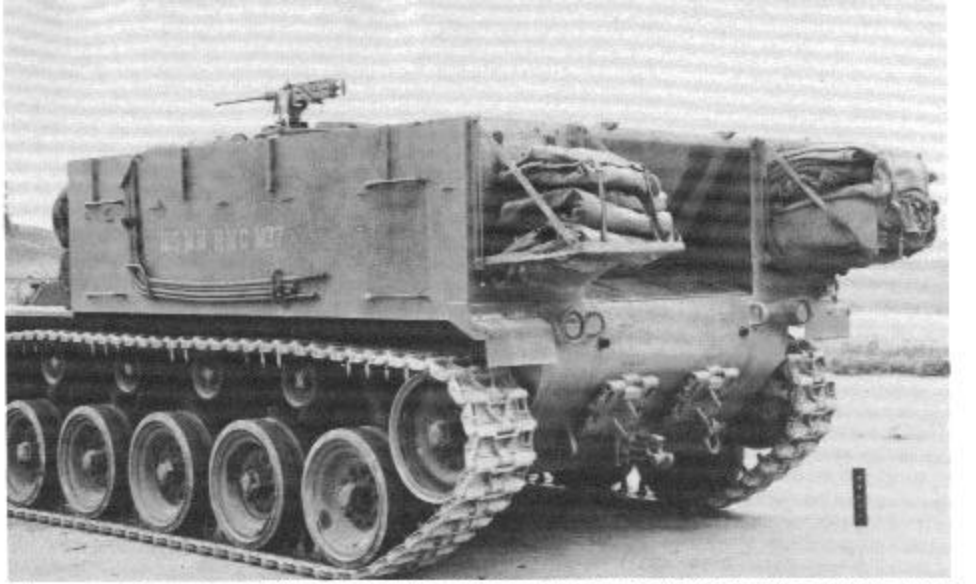


**Production M37 HMC**



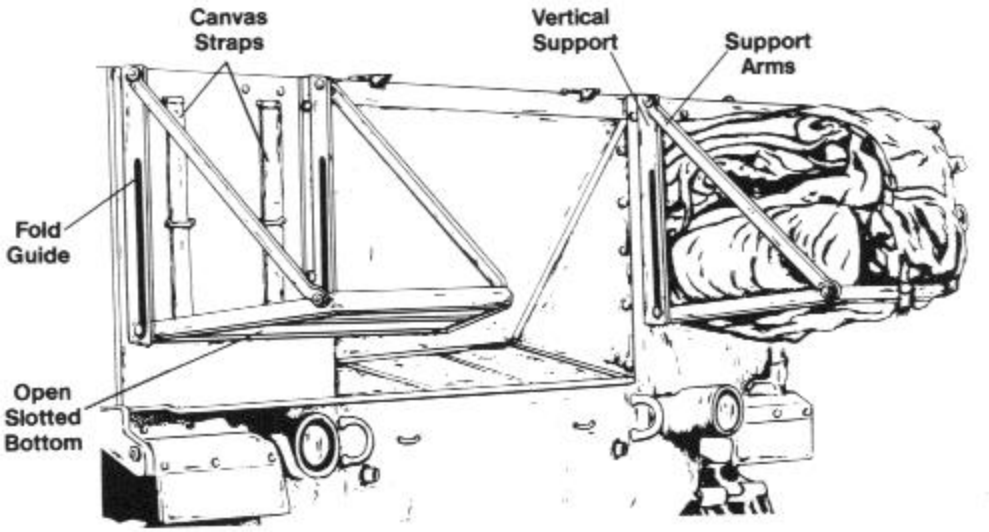
The internal arrangement of the M37 was similar to the earlier M7 Priest, however, the M37 had increased ammunition storage, more internal work space, a wider field of fire, and better crew protection.

Unlike the earlier M7 Priest the M37 superstructure extended the hull side plates the full length of the vehicle. The extended sides gave the M37 increased internal storage space and better protection for the crew from small arms fire and shell fragments.

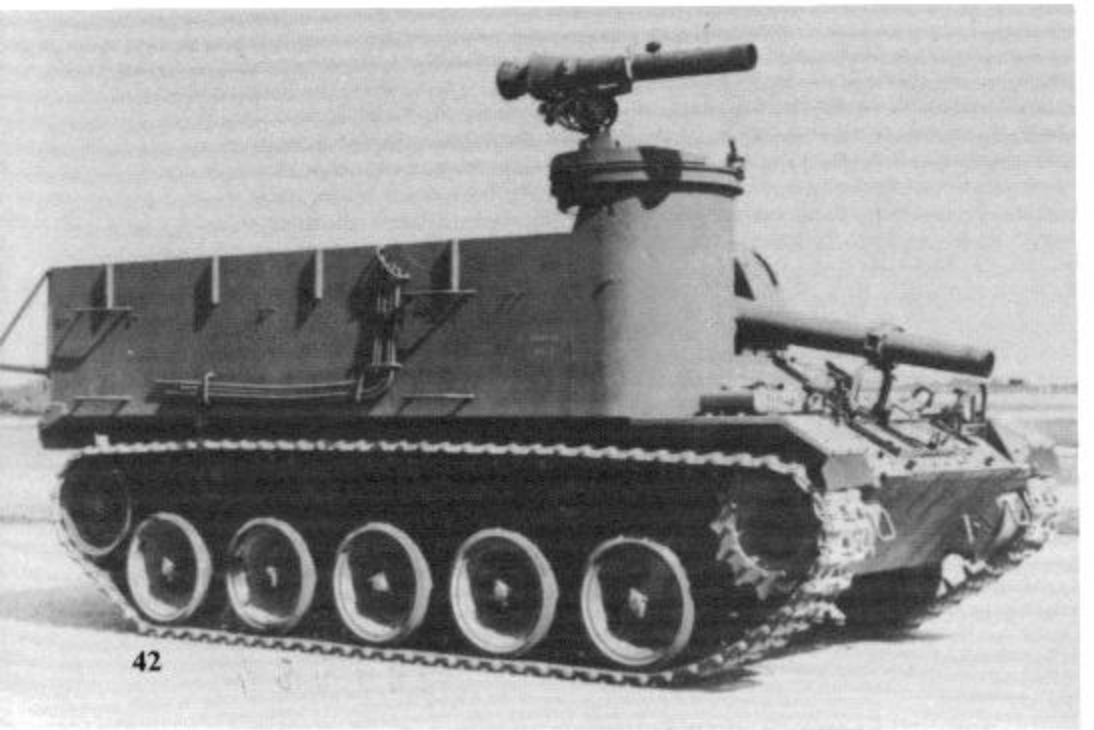


Storage racks were mounted on the rear of the vehicles which allowed the crew to carry additional equipment and supplies needed for long periods in the field. The racks could be folded down along the rear of the superstructure when not in use.

## Rear Folding Storage Racks

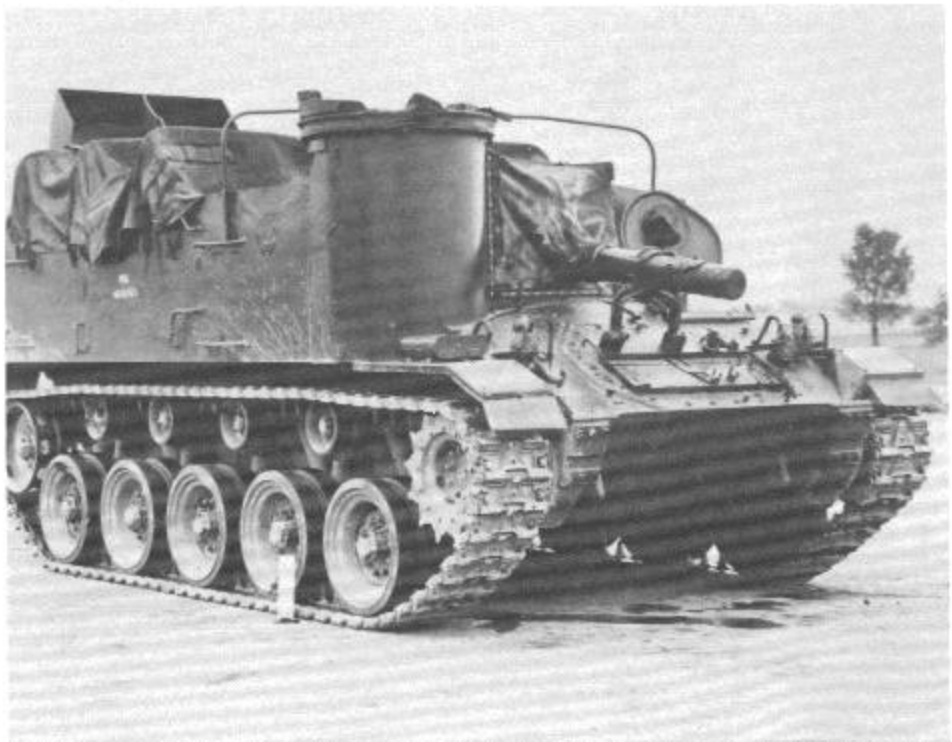


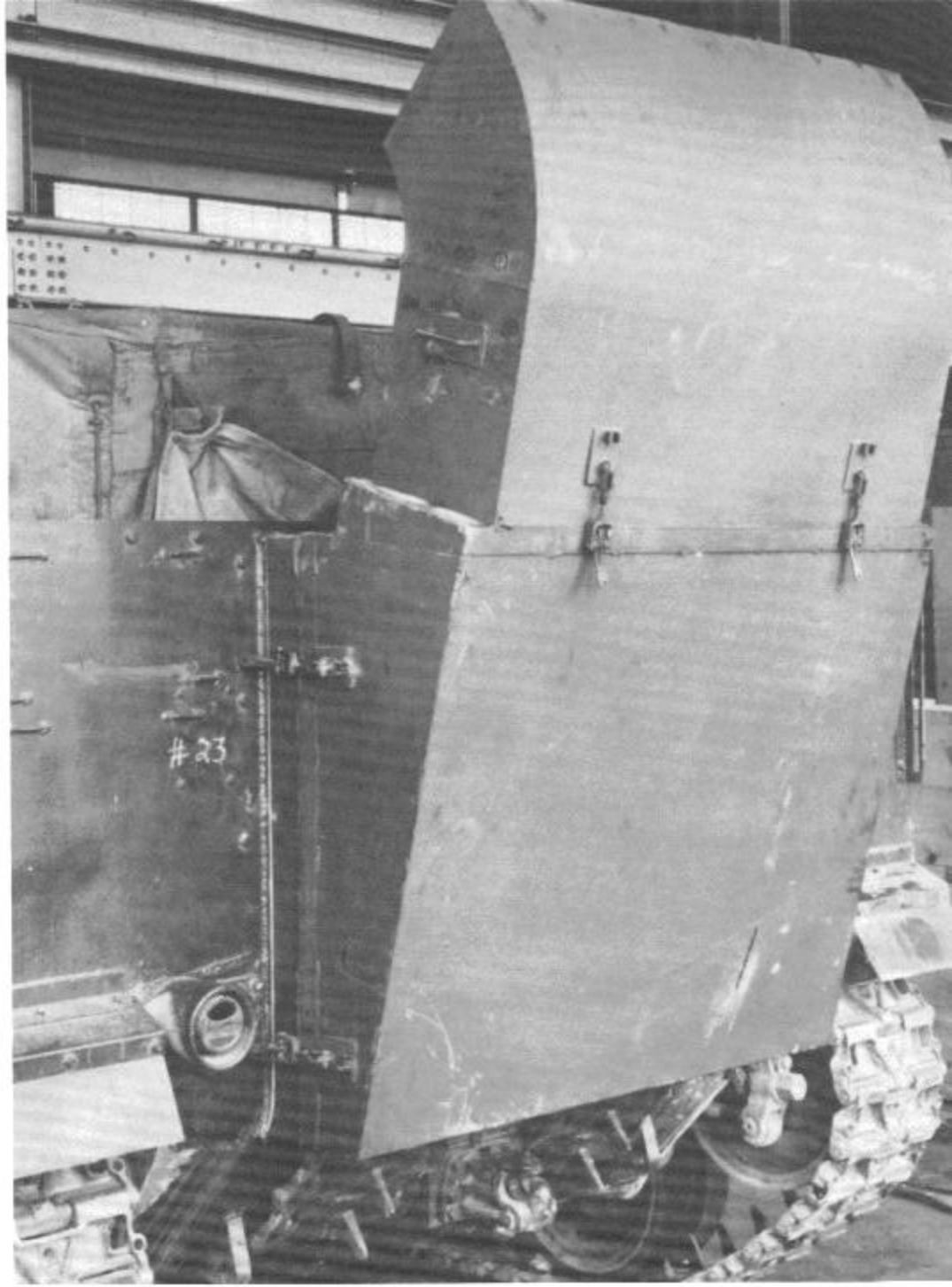

The Army tested various weapons on the M37 including a 75MM recoilless rifle in place of the .50 caliber anti-aircraft machine gun. Although the weapons were successfully tested, they were never used operationally.



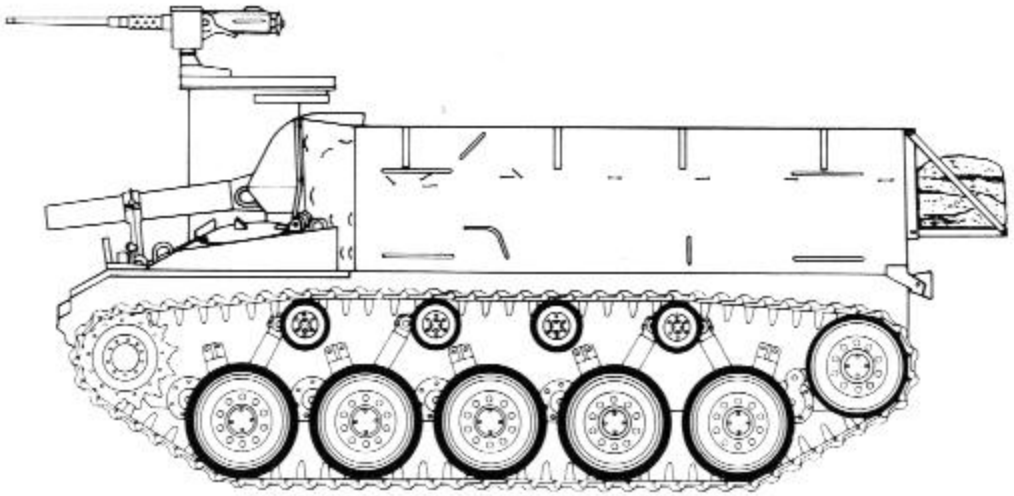
The T38 mortar carrier was a modified M37 with the 105MM cannon removed and the gun opening in the superstructure plated over. The T38 was armed with a 4.2 inch mortar mounted in the fighting compartment. When the war ended the Army cancelled the project.

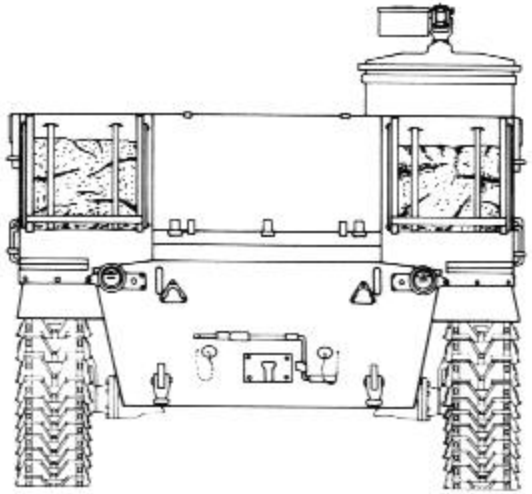
The gun and turret face of this M37 have been sealed with waterproof tarps in preparation for water tests. The rear mounted wading trunk was similar to those fitted to M4 Sherman tanks used during the D-Day landings and later Pacific amphibious operations.





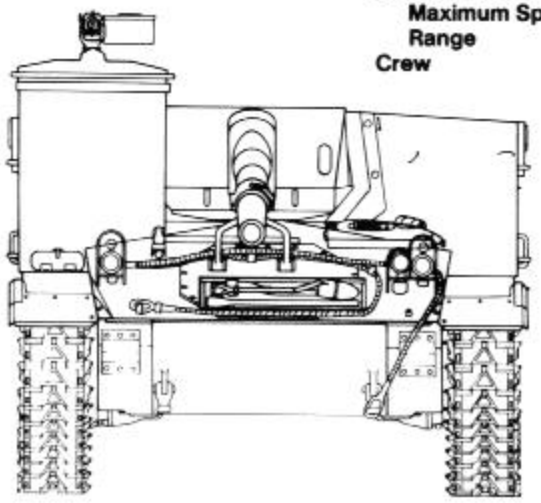

The M37 could be fitted out for deep wading or amphibious operations with the addition of a wading air trunk mounted at the rear of the vehicle and by sealing open areas with waterproof tarps.

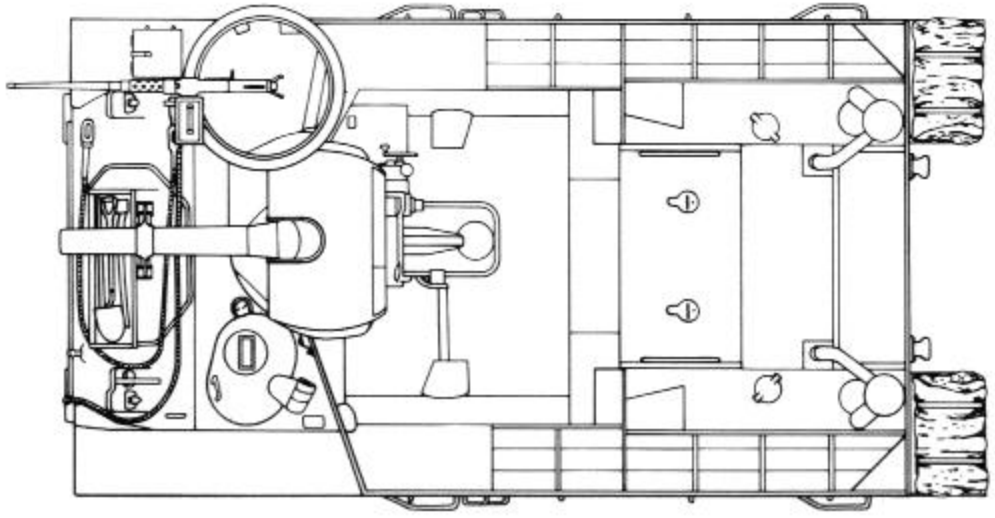




# Specifications
## M37 Howitzer Motor Carriage

| | |
|---|---|
| **Length** | 18 feet 2 inches |
| **Height** | 7 feet 4 inches |
| **Width** | 9 feet 11 inches |
| **Ground Clearance** | 17 inches |
| **Maximum Weight** | 40,000 pounds |
| **Powerplant** | Two Cadillac V8 gasoline engines |
| **Armament** | |
| **Main:** | One 105мм cannon |
| **Secondary:** | One .50 caliber anti-aircraft machine gun |
| **Performance** | |
| **Maximum Speed** | 35 mph |
| **Range** | 100-150 miles |
| **Crew** | Seven |





The ability of self-propelled guns such as these M37s of the 58th Field Artillery Battalion enabled them to quickly set up and provide fire support to hard pressed UN troops. Their presence often made the difference during the seesaw fighting which took place in the Spring of 1951. (US Army)

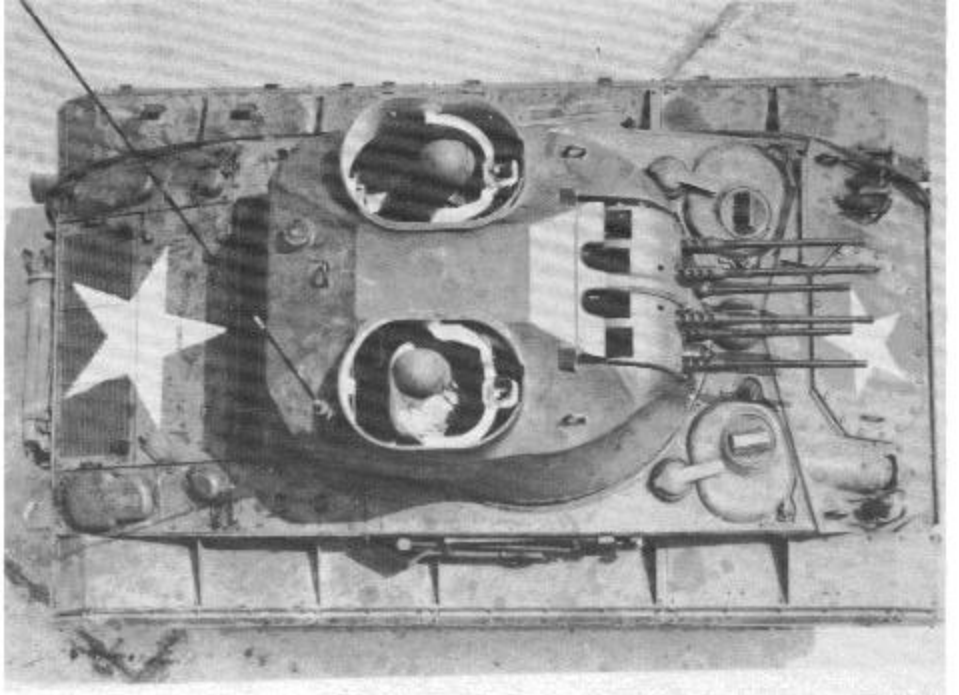
The crew of *CHIPPER* an M37 of the 3rd Armored Field Artillery Battalion, 2nd Armored Division, lay camouflage netting over their vehicle during OPERATION MONTE CARLO, a NATO exercise held in the summer of 1953 in central Germany. (US Army)

M37s remained in active service until the mid-1950s when they were replaced by closed top self propelled artillery vehicles. The crew of this M37 prepares to fire the 105MM gun at the Baumholder Firing Range in Germany during October of 1955. (US Army)

# T77 Multiple Gun Motor Carriage

In 1943 the Army began an attempt to develop an advanced, highly mobile anti-aircraft vehicle based on the M24 chassis. Unlike the M19, however, the new vehicle would retain the basic M24 chassis and hull. To meet its new role as a self-propelled anti-aircraft tank, the prototype was fitted with a new turret mounting six M2 .50 caliber Browning machine guns in place of the standard M24 turret. The turret had been developed by the U.S.Army Air Force using technology originally developed for the turrets used on the Boeing B-29 Superfortress heavy bomber. The six guns were remotely controlled using a remote sighting system similar to that of a B-29 turret. The guns fired at a rate of 400-500 rounds per minute per gun and it was felt that the combined weight of fire from the six .50 caliber machine guns would be enough to bring down any attacking aircraft. To meet the high ammunition usage requirements of the six guns, large ammunition bins were installed within the hull with the guns being fed through a series of flexible ammunition chutes. In combat the guns could be directed by either the commander or gunner, both being provided with individual gun controls and sights.

Work on the prototype was completed in the Spring of 1945 and the vehicle, designated the T77, began testing at the Aberdeen Proving Grounds in July. As a result of these early tests it was decided to modify the test vehicle with a computer sighting system, individual plexiglass crew cupolas on either side of the turret roof, and reduced armament of four .50 caliber machine guns. The modified vehicle was redesignated T77E1. Tests with the computerized sighting system were underway when the war ended in September of 1945 and the project cancelled.



**The machine gun turret carried on the T77 was similar in size to the standard cannon armed turret. Both the commander and gunners positions were equipped with remote control sighting systems and gun controls allowing either crewman to fire the weapons.**

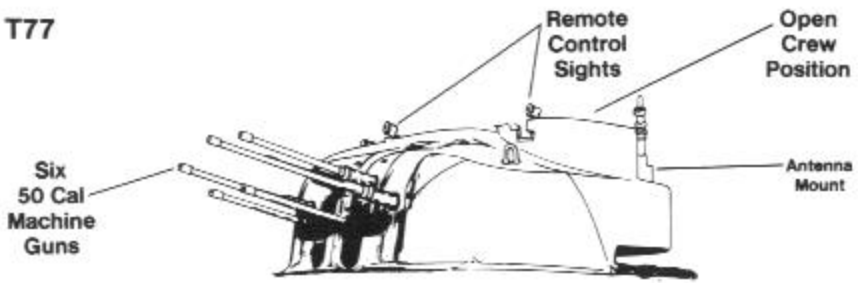
**The T77 anti-aircraft self-propelled pilot vehicle underwent tests at the Aberdeen Proving Grounds during the Spring of 1945. The vehicle was an M24 chassis with the 75MM turret replaced by a smaller turret armed with six M2 HB .50 caliber machine guns.**

**After series of tests during the Spring of 1945, the T77 was modified with a lead computing sighting system, refined gun mount, plexiglass covered cupolas for both the commander and gunner and redesignated the T77E1.**

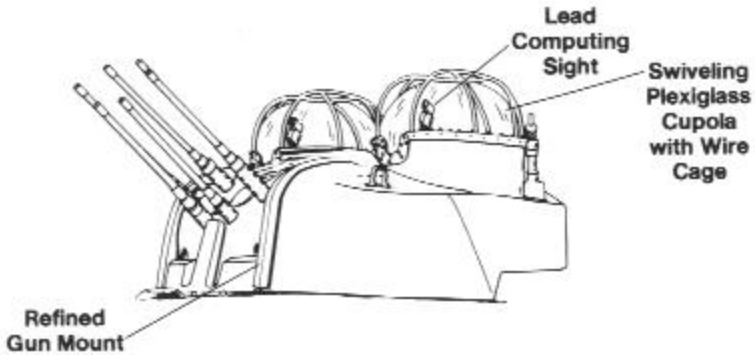
The plexiglass cupola covers swivelled to the rear for entering or exiting the vehicle. Although advanced for its time, official interest in the T77E1 declined after the war ended and the project was cancelled.

## Anti-Aircraft Turrets

**T77**




**T77E1**



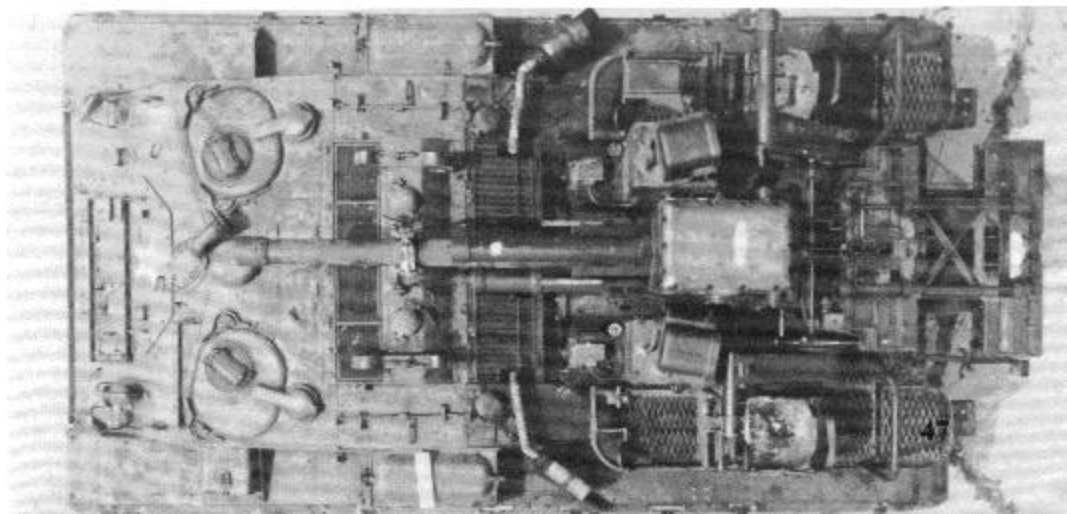

# T18 A.A./M24

Following the war the army conducted a number of experiments with a modified M19 chassis mounting the newly developed T18 automatic 75MM anti-aircraft gun. This weapon promised a much higher rate and weight of fire than had earlier anti-aircraft guns and the army was highly interested in converting the weapon into a mobile self-propelled anti-aircraft vehicle to protect armored formations.

The M19 was selected as the most suitable vehicle for conversion with the 75MM gun and its crew being mounted on a revolving platform at the rear of the chassis in a similar fashion to the M19 40MM mount. The T-18 mount, however, was an open mounting, lacking turret sides and gun shields to protect the crew. Tests conducted with the vehicle showed some potential, however, a lack of funds and waning official interest led to the project being cancelled in late 1947.

**Another project based on the M24 chassis was the T18 anti-aircraft vehicle. This vehicle mounted a T18 automatic 75MM anti-aircraft gun on a modified M24 chassis using a mount similar to the M19 anti-aircraft gun motor carriage.**

**The T18 gun offered a high rate of fire and a large projectile, however, official interest in the project waned and it was finally cancelled in 1947. The large gun put considerable stress on the light M24 hull and chassis when being fired in the automatic mode.**



# NM-116

During the late 1940s and early 1950s Norway received seventy-two M24s from the United States under the Military Assistance Program (MAP). These vehicles were used to equip the small armored element of the Norwegian army. Throughout the 1950s and 1960s the M24s provided the Norwegians with excellent service, however, by the end of the 1960s they were beginning to show their age. Rather than procure an entirely new vehicle, the Norwegian Army authorized modification of one M24 to serve as a prototype for a possible modernization program aimed at upgrading the entire M24 inventory. The firm of Thune-Eureka A/S, based in Oslo, was chosen to develop the prototype. The program called for the installation of a new engine, transmission, main armament, and numerous other internal and external improvements.

The original gasoline Cadillac engines were replaced with a supercharged Detroit 6V-53T diesel powerplant. To provide cooling for the new engine two radiators with hydraulically-driven thermostatically-controlled fans added to the sides of the engine compartment. Additionally four heat exchangers were installed to cool engine oil. The revised powerplant installation increased the M24s range and speed, while cutting down the fire potential by replacing the highly flammable gasoline with diesel fuel.

The hydromatic transmission was replaced with an Allison MT 650 pre-selector gear box with five forward and one reverse speed. An additional gearbox was installed which provided the correct speed to the differential located in the front of the chassis. The heat exchanger for the transmission and differential were located on the engine compartment, while the exchanger for the extra gearbox was fitted in the air flow of one radiator. A Freon fire extinguishing system with three bottles of Freon gas was installed to handle engine fires. Two bottles can be set off manually by the driver while the third bottle is set off automatically when the temperature in the engine compartment rises above a preset level. There is sufficient Freon in each bottle to put out any fire in the engine compartment.

The original 75MM gun was replaced by a French low pressure D/925 90MM gun equipped with a muzzle brake. The change of main armament required replacement of the barrel, telescopic reticle, modification of the breech ring, breech block, and extractor, removal of the gyrostabilizer, and rearrangement of the internal ammunition storage. The original recoil system used with the 75MM gun was retained. The turret was fitted with a basket which makes operation of the main armament easier for the crew and allows for a number of ready rounds to be carried in the turret. The gun is capable of using four types of ammunition, Canister, HEAT-FS, HE-FS, Smoke-FS. There is sufficient internal storage capacity to accommodate forty-one rounds of 90MM ammunition. Secondary armament was changed with the original .30 caliber coaxial machine gun being replaced by a .50 caliber machine gun. The bow .30 caliber machine was deleted and the original .50 caliber anti-aircraft machine gun was retained with a second gun mount installed on the turret roof in front of the commanders cupola.

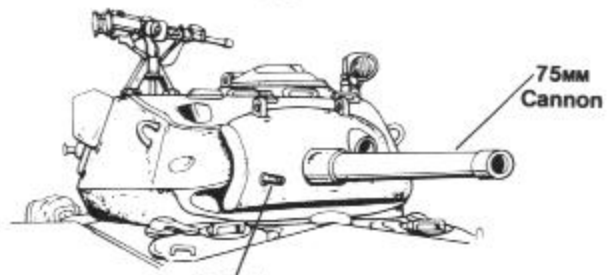
Within the crew compartment, the assistant driver/bow gunner's position was eliminated and the space used for ammunition storage. A more efficient heating system was installed to better protect the crew from the cold Norwegian climate. The battery storage position was moved to the crew compartment where hot air is passed over the batteries improving their ability to function in cold weather.

Other changes included; provisions for installation of a Simrad LV3 laser range finder mounted over the 90MM gun, two banks of four barreled German smoke dischargers mounted on either side of the turret, and provision for passive night-vision/infrared equipment for the commander, driver, and gunner. Besides the original T85E1 tracks, two other types of tracks, either German Diehl or Swedish Hogglund, can be used.

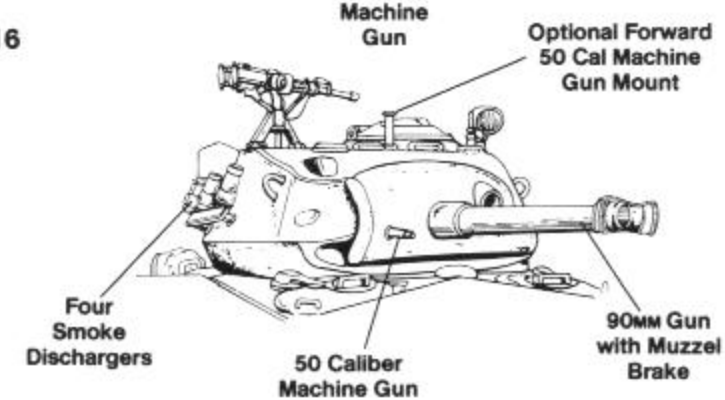
**During 1973, the Norwegian Army rebuilt a number of M24s under the designation NM-116 modifying them with a French 90MM gun, new engine, and transmission. This NM-116 retains the original T85E1 tracks used on the M24, although two newer types of track are available. (Armor Magazine)**

## Turrets

**M24**




**NM116**



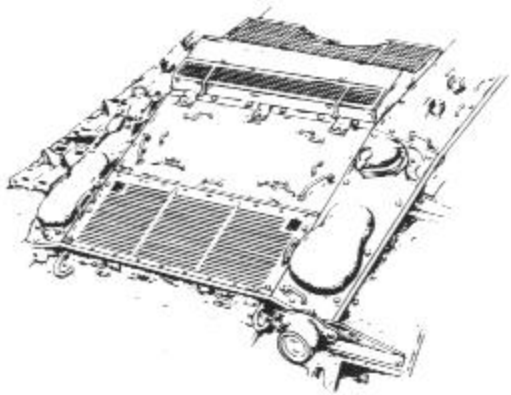
The modernized prototype M24 began acceptance trials in January of 1973 and after a series of grueling tests the Norwegian Army accepted the prototype. A contract was awarded for modernization of the remaining M24s in the Norwegian inventory to this configuration for use in the anti-tank role with the first unit being accepted in January of 1975. A total of fifty-four M24s were put through the modernization program, under the designation NM-116, with the last unit being delivered in October of 1976.

The Norwegian Army is pleased with the performance of these modernized M24s and their price which is approximately one third the cost of a completely new vehicle. The American firm of NAPCO Industries, Incorporated, was also impressed with the NM-116 and obtained rights for the license production of the vehicle for the world arms market. The NM-116 remains in active service in Norway where it is believed they will serve well into the 1990s and beyond.

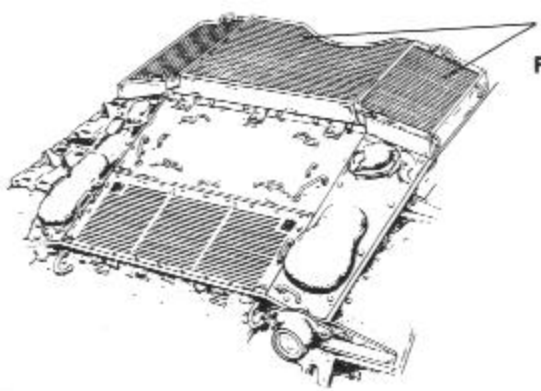
Both Greece and Taiwan were shown demonstrations of the NAPCO conversion in an attempt to interest them in upgrading their M24s. Taiwan opted for a reduced modernization package consisting of a NAPCO powerplant conversion kit changing the M24 powerplant from the Cadillac gasoline engine to a diesel engine. The Greeks, after viewing the NAPCO demonstration, attempted to perform a similar modification to their M24 fleet using engines left over from an M113 APC upgrade program. In the event, the conversion was unsuccessful and Greek M24s were relegated to static coastal defense positions while the Greek Government ponders a decision on whether or not to invest in the complete conversion program.

## Engine Deck

M24



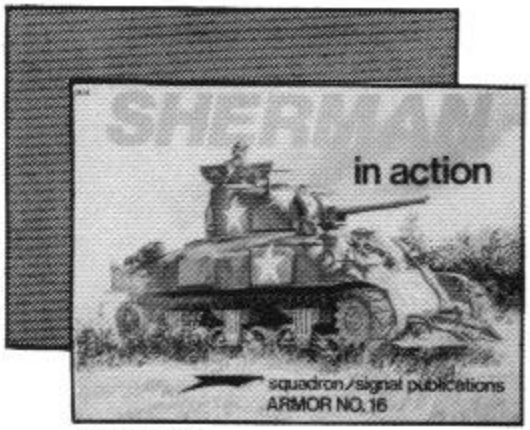
NM116



**The new diesel engine installation required rework of the rear engine deck grill work. The raised grill work under the turret storage bin helped improve cooling for the engine. The NM-116 also features a bank of four smoke dischargers mounted on either side of the turret. (Armor Magazine)**

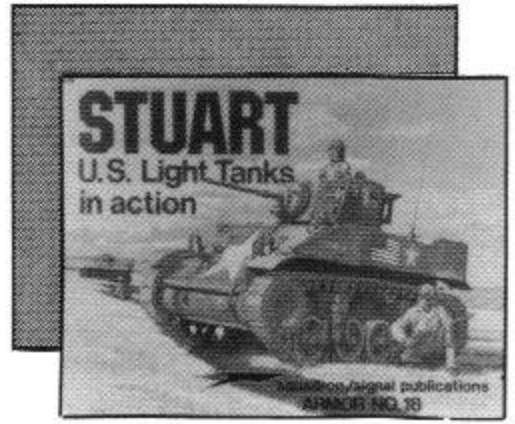
**The raised grill work under the turret is one of the recognition features of the NM-116. By rebuilding and rearming the M24, the Norwegians have developed an inexpensive yet viable anti-armor weapons system which is expected to remain in service for the next two decades. (Armor Magazine)**

# American Armor 'in Action'
## From Squadron/Signal

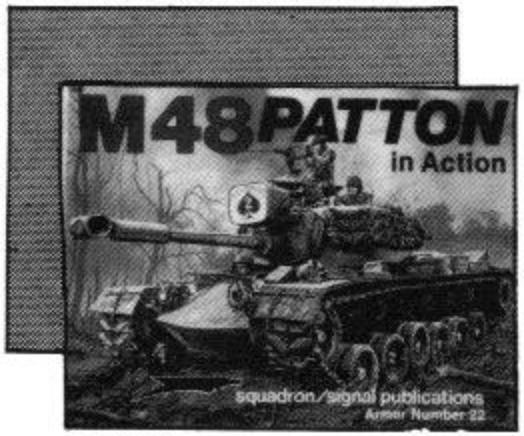


2016

2017



2018



2022

2023

**Squadron/Signal Publications, Inc.**

An M19 of the 15th Anti-Aircraft Artillery Battalion, 7th Infantry, occupies a dug-in camouflaged defensive position to provide fire support for UN troops at Hungnam Korea during December of 1951.

An M24 of the South Vietnamese Air Force Security Section guards the main gate at Tan Son Nhut air base from a sand bagged emplacement during the TET offensive of 1968.

ISBN 0-89747-205-5